MADE IN USA
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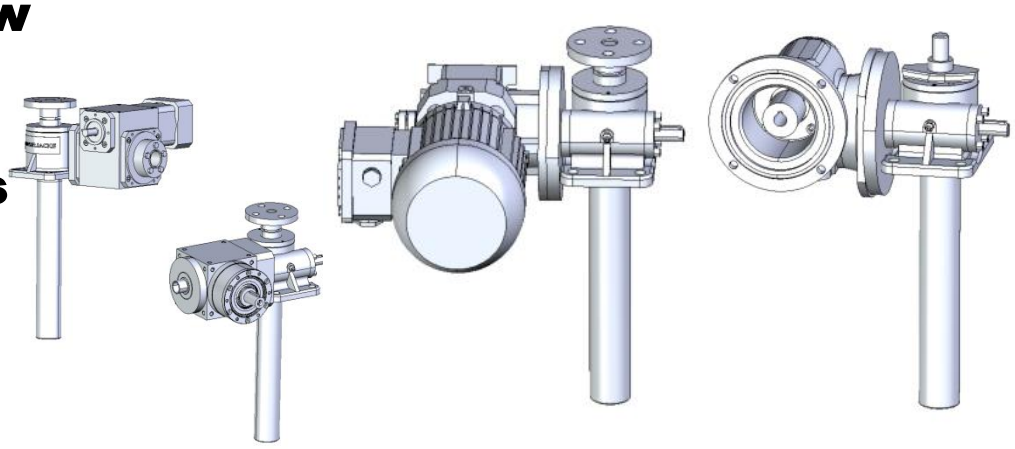
FANGAXIS - High Force Lifting Jacks & Guided Rack Axis

SCREW JACK COMBIKITS

- Machine Screw
- Ball Screws
- Translating
- Traveling Nuts
- AC Motors
- Servo Mounts
- Stainless
- Handwheels
- Double Extended Inputs



Neptune & Triton Jacks

High Duty Cycle

- Planetary Screw
- Ball Screw

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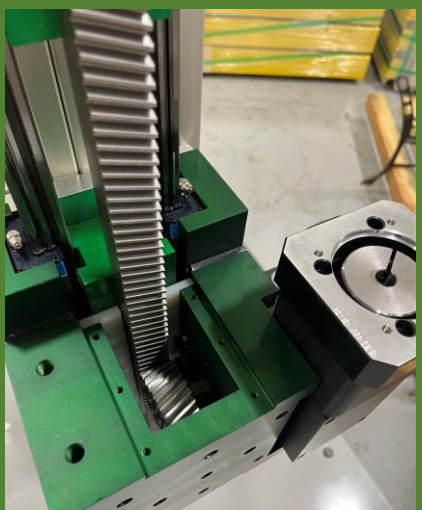
High Duty Cycle

- Guided Rack Axis

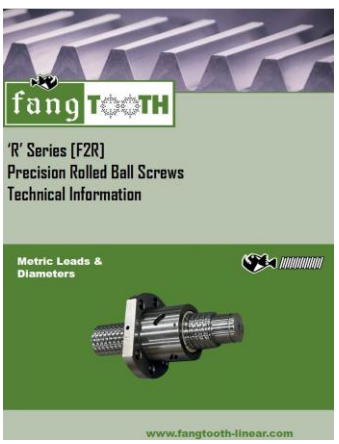


Other Products

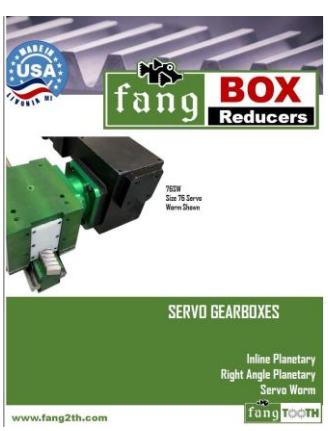
Automation Ideas with Teeth

fang TOOTH

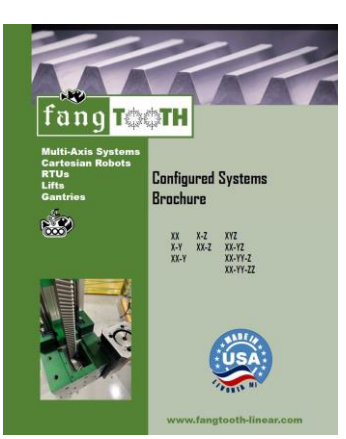
Linear Actuators | Ball Screws | Gearboxes | Lifts | Systems



Ball Screw Assemblies And Linear Actuators



Servo & Industrial Gearboxes



Multi-Axis Systems

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

CALL TODAY

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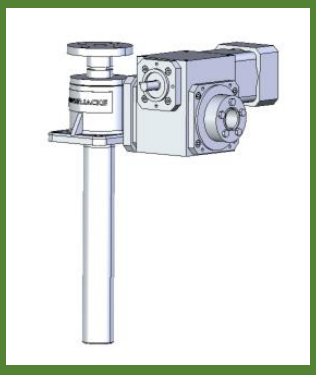
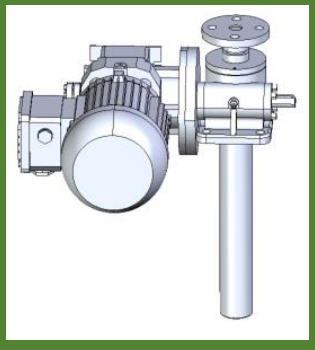
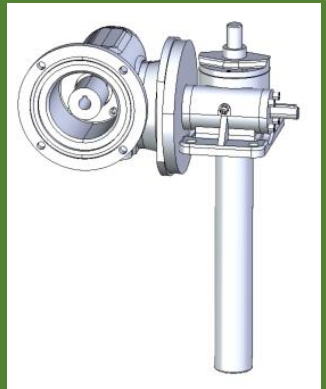
BLACKJACK



BLUEJACK



SILVERJACK



Screw Jack Combikits

MADE IN USA LIVONIA MI

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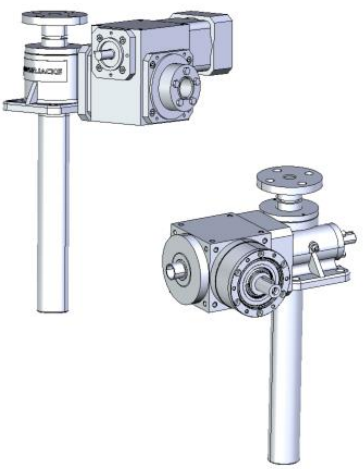
SCREW JACK COMBIKITS

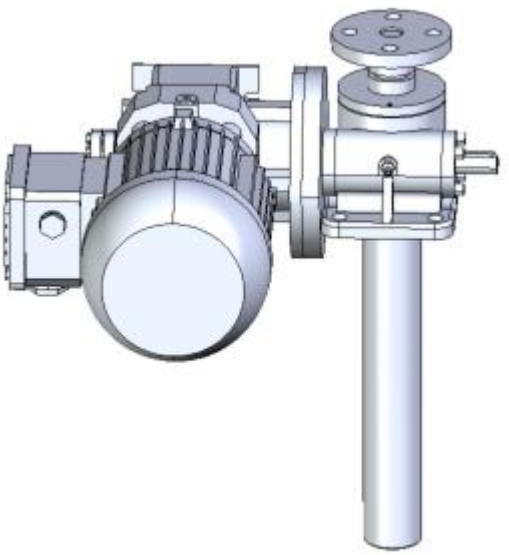
Blackjack
High Performance (Servo Rated)
Worm Gear or Spiral Bevel Gear

Machine Screw
Ball Screws



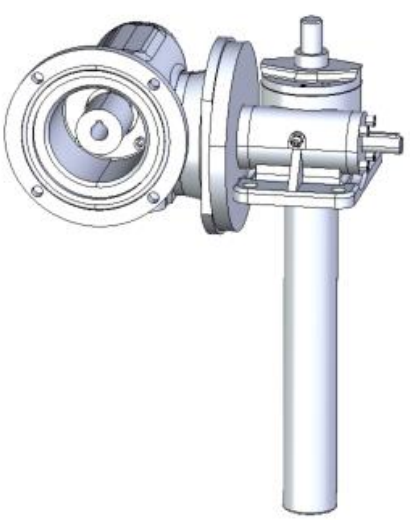
Bluejack
Heavy Combination
Gearmotor (1750rpm input)

Machine Screw
Ball Screws



Silverjack
Stainless Steel (1750rpm input)
Corrosion Duty Worm or Bevel

Machine Screw



INSPIRE . GREAT . AUTOMATION

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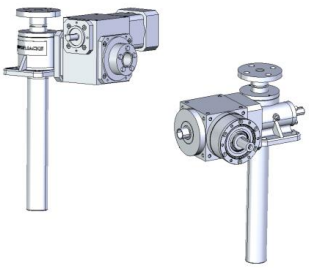
HOW TO ORDER SCREW JACK COMBIKITS



Three Step Ordering Process

STEP "1"
Select Master COMBIKIT Order Code

1

combikit

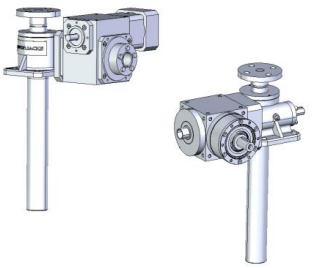
order code : COMBIKIT025KN-1000-XXXXXX

Size
025KN – 25 KN / 2.8 Ton
050KN – 50 KN / 5.5 Ton
100KN – 100 KN / 1.1 Ton
200KN – 200KN / 22.5 Ton

Overall Rise mm

Engineering Number to be assigned at time of formal quotation for RFQ
use date code
I.E. 20250115

HOW TO ORDER SCREW JACK COMBIKITS



Three Step Ordering Process

STEP "2"
Select SCREW JACK

2

Screw Jacks
order code : EMT0025-U001100-0305-EB00-0000 X

Style
EMT – Translating
EMR – Rotating Nut

Size
025KN – 25 KN / 2.8 Ton
050KN – 50 KN / 5.5 Ton
100KN – 100 KN / 1.1 Ton
200KN – 200KN / 22.5 Ton

Mounting / Material
U – Upright (Steel Screw)
I – Inverted (Steel Screw)

V- Upright (Stainless Jack)
F- Inverted (Stainless Jack)

Lead Option / Jack Ratio
11 – Lead Option 1, Low Ratio
12 – Lead Option 2, Low Ratio

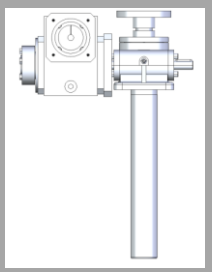
21 – Lead Option 1, High Ratio
22 – Lead Option 2, High Ratio

Overall Rise mm

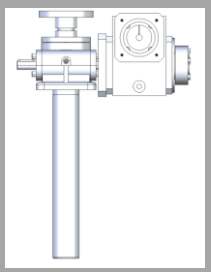
E - Threaded End
C - Clevis End
T - Top Plate
F - Fork End
R - Rod End
J -Plain End
P -Pilot End #1
N- No Pilot End

MANY OTHER OPTIONS AVAILABLE UPON REQUEST such as:
Anti-Backlash, Keyed Anti-Rotate, Base Mounting, Single/Double Worm Shafts, etc

HOW TO ORDER



"GX" left



"XG" right

Three Step Ordering Process

STEP "3"
Select SIDEDRIVE Code for Additional Drive

3

SIDEDRIVE order code : SD051GhD0005GX0010BR-XXXX

BLACKJACK Gearbox Size / Type

051GhD – 2.8 Ton Worm
064GhD – 5.5 Ton Worm
076GhD – 11 Ton Worm
089GhD – 22.5 Ton Worm

110SpB – 2.8 Ton Spiral Bevel
140SpB – 5.5 Ton Spiral Bevel
170SpB – 11 Ton Spiral Bevel
170SpB – 22.5 Ton Spiral Bevel

BLUEJACK Gearbox Size / Type

022GrM – 2.8 Ton Gearmotor
033GrM – 5.5 Ton Gearmotor
043GrM – 11 Ton Gearmotor
043GrM – 22.5 Ton Gearmotor

SILVERJACK Gearbox Size / Type

044K69 – 1.1 Ton Worm
044K69 – 2.8 Ton Worm
060K69 – 5.5 Ton Worm
076K69 – 11 Ton Worm

110SsB – 2.8 Ton Spiral Bevel
140SsB – 5.5 Ton Spiral Bevel
170SsB – 11 Ton Spiral Bevel
170SsB – 22.5 Ton Spiral Bevel

BLACKJACK Gear Ratio

Worm Gear Options

0005	0008	0015
0006	0009	
0007	0010	

Spiral Bevel Options

0001	0003	0007
01.5	0004	0010
0002	0005	0015

BLUEJACK Gearmotor Ratios

2.8 Ton
05.20 – 5.2:1
06.91 – 6.91:1
09.25 – 9.25:1

5.5 Ton	11.0 & 22.5 Ton
04.17 – 4.17:1	05.05 – 5.05:1
06.89 – 6.89:1	07.44 – 7.44:1
10.00 – 10.00:1	09.57 – 9.:1

SILVER JACK Gear Ratio

Worm Gear Options
0005 – 5:1
07.5 – 7.5:1
0010 – 10:1

Spiral Bevel Options

0001	0003	0007
01.5	0004	0010
0002	0005	0015

DIP – Double Input With Motor
E – Encoder
ZZZZ – See Specification

Input / Motor

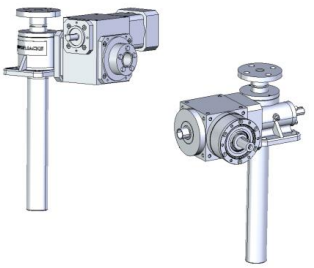
SIP – Single Input
DIP – Double Input
56C – Nema Mount
143C – Nema Mount
145C – Nema Mount

Servo Mounts
Motor PN

0016-56C - 0.16 hp
0025-56C - 0.25 hp
0033-56C - 0.33 hp
0050-56C - 0.50
0075-56C - 0.75 hp
A100-56C - 1.00 hp
B100-143TC - 1.00
0150-145TC - 1.50 hp
0200-145TC - 2.00 hp
0300-182TC - 3.00 hp

Add "BR" for Brake

HOW TO ORDER SCREW JACK COMBIKITS



Final Specification Example

Screw Jack Combikit order code:

COMBIKIT025KN-0305-XXXXXX [interim 20250115]

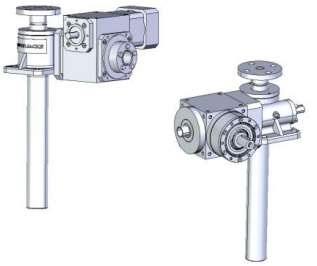
With Description:
Kit including
QTY 1 Jack PN:
EMT0025-U001100-0305-EB00-0000

and

QTY 1 Sidedrive PN:
SC051GhD0005GX0010BR-XXXX

2.5Kn (2.8T) Combikit, 305mm (12 inch) rise
with Screw Jack EMT0025-U001100-0305-EB00-0000
And 5:1 Ratio Ghost Drive Worm Gear BLACKJACK
SideDrive with 1 HP AC Brakemotor left mount (GX)
No other additional features

SELECTION CHARTS Blackjack
High Performance Machine Screw



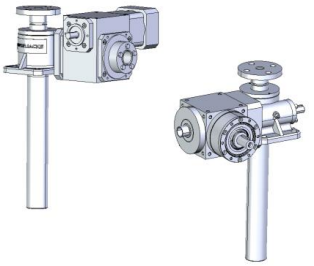
Worm Gear [GhD] LEAD 1

Option 1 LEAD DATA		Side Drive 5:1 Ratio	Side Drive 6:1 Ratio	Side Drive 7:1 Ratio	Side Drive 8:1 Ratio	Side Drive 9:1 Ratio	Side Drive 10:1 Ratio	Side Drive 15:1 Ratio
Travel Speed	Efficiency	14.17 in/min	11.81 in/min	10.12 in/min	8.85 in/min	7.87 in/min	7.08 in/min	4.72 in/min
051GhD – 2.8 Ton Worm	0.264 (6:1)	30:1 Net	36:1 Net	42:1 Net	48:1 Net	54:1 Net	60:1 Net	90:1 Net
1/3HP Lifting Capacity	(lbs)	1165 lbs	1398 lbs	1630 lbs	1863 lbs	2095 lbs	2235 lbs	3218 lbs
1/2 HP Lifting Capacity	(lbs)	1765 lbs	2118 lbs	2470 lbs	2823 lbs	3175 lbs	3386 lbs	4877 lbs
3/4 HP Lifting Capacity	(lbs)	2648 lbs	3178 lbs	3705 lbs	4234 lbs	4764 lbs	NA	NA
1 HP Lifting Capacity	(lbs)	3530 lbs	4236 lbs	4939 lbs	NA	NA	NA	NA
Travel Speed	Efficiency	21.25 in/min	17.72 in/min	15.18 in/min	13.28 in/min	11.81 in/min	10.62 in/min	7.08 in/min
064GhD – 5.5 Ton Worm	0.281 (6:1)	30:1 Net	36:1 Net	42:1 Net	48:1 Net	54:1 Net	60:1 Net	90:1 Net
1 HP Lifting Capacity	(lbs)	2211 lbs	2653 lbs	3094 lbs	3536 lbs	3978 lbs	4243 lbs	6109 lbs
1.5 HP Lifting Capacity	(lbs)	3316 lbs	3980 lbs	4640 lbs	5303 lbs	5966 lbs	6364 lbs	9164 lbs
2 HP Lifting Capacity	(lbs)	4422 lbs	5306 lbs	6187 lbs	7071 lbs	7955 lbs	8485 lbs	NA
Travel Speed	Efficiency	21.26 in/min	17.72 in/min	15.18 in/min	13.28	11.81	10.62	7.08
076GhD – 11 Ton Worm	0.272 (8:1)	40:1 Net	48:1 Net	56:1 Net	64:1 Net	72:1 Net	80:1 Net	120:1 Net
1 HP Lifting Capacity	(lbs)	1431 lbs	1717 lbs	2002 lbs	2288 lbs	2574 lbs	2745 lbs	3953 lbs
1.5 HP Lifting Capacity	(lbs)	2146 lbs	2575 lbs	3003 lbs	3432 lbs	3860 lbs	4118 lbs	5930 lbs
2 HP Lifting Capacity	(lbs)	2861 lbs	3434 lbs	4003 lbs	4575 lbs	5147 lbs	5490 lbs	7906 lbs
3 HP Lifting Capacity	(lbs)	4291 lbs	5150 lbs	6005 lbs	6863 lbs	7720 lbs	8235 lbs	11859 lbs
5 HP Lifting Capacity	(lbs)	7153 lbs	8583 lbs	10008 lbs	11438 lbs	12868 lbs	13726 lbs	NA
Travel Speed	Efficiency	21.26 in/min	17.72 in/min	15.18 in/min	13.28	11.81	10.62	7.08
089GhD – 22.5 Ton Worm	.242 (8:1)	40:1 Net	48:1 Net	56:1 Net	64:1 Net	72:1 Net	80:1 Net	120:1 Net
3 HP Lifting Capacity	(lbs)	4824 lbs	5789 lbs	6749 lbs	7714 lbs	8678 lbs	9257 lbs	13330 lbs
5 HP Lifting Capacity	(lbs)	8040 lbs	9648 lbs	11249 lbs	12856 lbs	14463 lbs	15428 lbs	22216 lbs
7.5 HP Lifting Capacity	(lbs)	12060 lbs	14472 lbs	16874 lbs	19285 lbs	21695 lbs	23142 lbs	33324 lbs

Worm Gear [GhD] LEAD 2

Option 2 LEAD DATA		Side Drive 5:1 Ratio	Side Drive 6:1 Ratio	Side Drive 7:1 Ratio	Side Drive 8:1 Ratio	Side Drive 9:1 Ratio	Side Drive 10:1 Ratio	Side Drive 15:1 Ratio
Travel Speed	Efficiency	28.34 in/min	23.62 in/min	20.24 in/min	17.7 in/min	15.74 in/min	14.16 in/min	9.44 in/min
051GhD – 2.8 Ton Worm	0.383 (6:1)	30:1 Net	36:1 Net	42:1 Net	48:1 Net	54:1 Net	60:1 Net	90:1 Net
1/!3HP Lifting Capacity	(lbs)	1690 lbs	2028 lbs	2365 lbs	2703 lbs	3041 lbs	3243 lbs	4670 lbs
1/2 HP Lifting Capacity	(lbs)	2560 lbs	3072 lbs	3583 lbs	4095 lbs	4607 lbs	4913 lbs	7075 lbs
3/4 HP Lifting Capacity	(lbs)	3841 lbs	4610 lbs	5375 lbs	6143 lbs	6911 lbs	NA	NA
1 HP Lifting Capacity								
Travel Speed	Efficiency	28.34 in/min	23.62 in/min	20.24 in/min	17.7 in/min	15.74 in/min	14.16 in/min	9.44 in/min
064GhD – 5.5 Ton Worm	0.398 (6:1)	30:1 Net	36:1 Net	42:1 Net	48:1 Net	54:1 Net	60:1 Net	90:1 Net
1 HP Lifting Capacity	(lbs)	3132 lbs	3758 lbs	4382 lbs	5008 lbs	5634 lbs	6009 lbs	8653 lbs
1.5 HP Lifting Capacity	(lbs)	4697 lbs	5637 lbs	6572 lbs	7511 lbs	8450 lbs	9014 lbs	NA
2 HP Lifting Capacity	(lbs)	6263 lbs	7516 lbs	8763 lbs	NA	NA	NA	NA
Travel Speed	Efficiency	42.51 in/min	35.43 in/min	30.36 in/min	26.55 in/min	23.61 in/min	21.24 in/min	14.16 in/min
076GhD – 11 Ton Worm	0.388 (8:1)	40:1 Net	48:1 Net	56:1 Net	64:1 Net	72:1 Net	80:1 Net	120:1 Net
1 HP Lifting Capacity	(lbs)	2041 lbs	2449 lbs	2855 lbs	3263 lbs	3671 lbs	3916 lbs	5632 lbs
1.5 HP Lifting Capacity	(lbs)	3061 lbs	3673 lbs	4285 lbs	4895 lbs	5507 lbs	5874 lbs	8459 lbs
2 HP Lifting Capacity	(lbs)	4081 lbs	4898 lbs	5711 lbs	6527 lbs	7342 lbs	7832 lbs	11278 lbs
3 HP Lifting Capacity	(lbs)	6122 lbs	7347 lbs	8566 lbs	9790 lbs	11014 lbs	11748 lbs	16917 lbs
5 HP Lifting Capacity	(lbs)	10204 lbs	12244 lbs	14277 lbs	16317 lbs	18356 lbs	NA	NA
Travel Speed	Efficiency	42.51 in/min	35.43 in/min	30.36 in/min	26.55 in/min	23.61 in/min	21.24 in/min	14.16 in/min
089GhD – 22.5 Ton Worm	.357 (8:1)	40:1 Net	48:1 Net	56:1 Net	64:1 Net	72:1 Net	80:1 Net	120:1 Net
3 HP Lifting Capacity	(lbs)	7116 lbs	8540 lbs	9957 lbs	11380 lbs	12802 lbs	13655 lbs	19664 lbs
5 HP Lifting Capacity	(lbs)	11860 lbs	14233 lbs	16595 lbs	18966 lbs	21337 lbs	22759 lbs	32773 lbs
7.5 HP Lifting Capacity	(lbs)	17791 lbs	21349 lbs	24893 lbs	28449 lbs	32005 lbs	34139 lbs	NA

SELECTION CHARTS Blackjack
High Performance Machine Screws

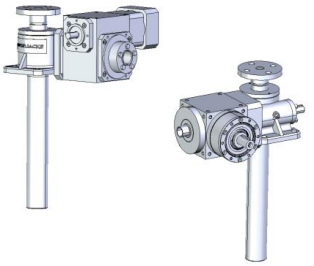


Spiral Bevel Gear [SpB] LEAD 1

Option 1 LEAD DATA		Side Drive 1:1 Ratio	Side Drive 1.5:1 Ratio	Side Drive 2:1 Ratio	Side Drive 3:1 Ratio	Side Drive 4:1 Ratio	Side Drive 5:1 Ratio	Side Drive 10:1 Ratio
Travel Speed	Efficiency	70.85 in/min	47.23 in/min	35.43 in/min	23.62 in/min	17.71 in/min	14.17 in/min	7.09 in/min
110SpB – 2.8 Ton Bevel	0.264 (6:1)	6:1 Net	9:1 Net	12:1 Net	18:1 Net	24:1 Net	30:1 Net	60:1 Net
3/4 HP Lifting Capacity	(lbs)	530 lbs	794 lbs	1060 lbs	1589 lbs	2118 lbs	2648 lbs	3813 lbs
1 HP Lifting Capacity	(lbs)	706 lbs	1059 lbs	1412 lbs	2118 lbs	2824 lbs	3530 lbs	5084 lbs
Travel Speed	Efficiency	70.85 in/min	47.23 in/min	35.43 in/min	23.62 in/min	17.71 in/min	14.17 in/min	7.09 in/min
140SpB – 5.5 Ton Bevel	0.281 (6:1)	6:1 Net	9:1 Net	12:1 Net	18:1 Net	24:1 Net	30:1 Net	60:1 Net
1 HP Lifting Capacity	(lbs)	663 lbs	995 lbs	1327 lbs	1990 lbs	2653 lbs	3317 lbs	6633 lbs
1.5 HP Lifting Capacity	(lbs)	995 lbs	1493 lbs	1990 lbs	2985 lbs	3980 lbs	4975 lbs	9950 lbs
2 HP Lifting Capacity	(lbs)	1327 lbs	1990 lbs	2653 lbs	3980 lbs	5307 lbs	6633 lbs	NA
Travel Speed	Efficiency	106.28 in/min	70.85 in/min	53.14in/min	35.43 in/min	26.57 in/min	21.26 in/min	10.63 in/min
170SpB – 11 Ton Bevel	0.272 (8:1)	40:1 Net	48:1 Net	56:1 Net	64:1 Net	72:1 Net	80:1 Net	120:1 Net
1.5 HP Lifting Capacity	(lbs)	1371 lbs	2056 lbs	2741 lbs	4112 lbs	5482 lbs	6853 lbs	13706 lbs
2 HP Lifting Capacity	(lbs)	1827 lbs	2741 lbs	3655 lbs	5482 lbs	7310 lbs	9137 lbs	18275 lbs
3 HP Lifting Capacity	(lbs)	2741 lbs	4112 lbs	5482 lbs	8224 lbs	10965 lbs	13706 lbs	NA
5 HP Lifting Capacity	(lbs)	4569 lbs	6853 lbs	9137 lbs	13706 lbs	18275 lbs	NA	NA
Travel Speed	Efficiency	106.28 in/min	70.85 in/min	53.14in/min	35.43 in/min	26.57 in/min	21.26 in/min	10.63 in/min
170SpB – 22.5 Ton Bevel	.242 (8:1)	40:1 Net	48:1 Net	56:1 Net	64:1 Net	72:1 Net	80:1 Net	120:1 Net
3 HP Lifting Capacity	(lbs)	3081 lbs	4621 lbs	6162 lbs	9243 lbs	12324 lbs	15405 lbs	30810 lbs
5 HP Lifting Capacity	(lbs)	5135 lbs	7702 lbs	10270 lbs	15405 lbs	20540 lbs	25675 lbs	NA
7.5 HP Lifting Capacity	(lbs)	7702 lbs	11554 lbs	15405 lbs	23107 lbs	30810 lbs	38512 lbs	NA

SELECTION CHARTS Bluejack

Heavy Combination Gearmotor Machine Screws

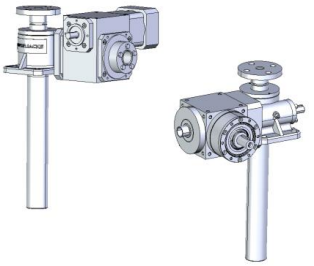


Helical Bevel Gearmotor [GrM] LEAD 1

Option 1 LEAD DATA		Side Drive	Side Drive	Side Drive	Side Drive	Side Drive	Side Drive
Travel Speed	Efficiency	4.17:1 Ratio	5.2:1 Ratio	6.89:1 Ratio	6.91:1 Ratio	9.25:1 Ratio	10.0:1 Ratio
022GrM – 2.8 Ton [GrM]	0.264 (6:1)	17 in/min	13.63 in/min	10.28 in/min	10.25 in/min	7.66 in/min	7.09 in/min
1/3HP Lifting Capacity	(lbs)	25.02:1 Net	31.20:1 Net	41.34:1 Net	41.46:1 Net	55.50:1 Net	60:1 Net
1/2 HP Lifting Capacity	(lbs)	NA	1224 lbs	NA	1626 lbs	2177 lbs	NA
3/4 HP Lifting Capacity	(lbs)	NA	1854 lbs	NA	2464 lbs	3299 lbs	NA
1 HP Lifting Capacity	(lbs)	NA	2781 lbs	NA	3696 lbs	4948 lbs	NA
		NA	3709 lbs	NA	4928 lbs	NA	NA
Travel Speed	Efficiency	25.49 in/min	20.44 in/min	15.42 in/min	15.38 in/min	11.49 in/min	10.63 in/min
033GrM – 5.5 Ton [GrM]	0.281 (6:1)	25.02:1 Net	31.20:1 Net	41.34:1 Net	41.46:1 Net	55.50:1 Net	60:1 Net
1 HP Lifting Capacity	(lbs)	2597 lbs	NA	4292 lbs	NA	NA	6229 lbs
1.5 HP Lifting Capacity	(lbs)	3896 lbs	NA	6438 lbs	NA	NA	9343 lbs
2 HP Lifting Capacity	(lbs)	5195 lbs	NA	8583 lbs	NA	NA	NA

Option 1 LEAD DATA		Side Drive	Side Drive	Side Drive
Travel Speed	Efficiency	5.05:1 Ratio	7.44:1 Ratio	9.57:1 Ratio
043GrM – 11 Ton [GrM]	0.272 (8:1)	21.04 in/min	14.28 in/min	11.11 in/min
		40.40:1 Net	59.52:1 Net	76.56:1 Net
1.5 HP Lifting Capacity	(lbs)	6499 lbs	9575 lbs	12317 lbs
2 HP Lifting Capacity	(lbs)	8666 lbs	12767 lbs	16422 lbs
3 HP Lifting Capacity	(lbs)	12999 lbs	19151 lbs	NA
Travel Speed	Efficiency	21.04 in/min	14.28 in/min	11.11 in/min
043GrM – 22.5 Ton [GrM]	.242 (8:1)	40.40:1 Net	59.52:1 Net	76.56:1 Net
3 HP Lifting Capacity	(lbs)	14610 lbs	21525 lbs	27687 lbs
5 HP Lifting Capacity	(lbs)	24350 lbs	35874 lbs	NA
7.5 HP Lifting Capacity	(lbs)	36625 lbs	NA	NA

SELECTION CHARTS Silverjack
Stainless Steel Machine Screws



Stainless Worm Gear [69K] LEAD 1

Option 1 LEAD DATA		Side Drive 5:1 Ratio	Side Drive 7.5:1 Ratio	Side Drive 10:1 Ratio
Travel Speed	Efficiency	14.17 in/min	10.12 in/min	7.08 in/min
044K69 – 2.8 Ton Worm	0.264 (6:1)	30:1 Net	42:1 Net	60:1 Net
1/3HP Lifting Capacity	(lbs)	1165 lbs	1748 lbs	2236 lbs
1/2 HP Lifting Capacity	(lbs)	1765 lbs	2648 lbs	3388 lbs
3/4 HP Lifting Capacity	(lbs)	2646 lbs	3972 lbs	NA
1 HP Lifting Capacity	(lbs)	3530 lbs	5295 lbs	NA
Travel Speed	Efficiency	21.26 in/min	15.18 in/min	10.62 in/min
060K69 – 5.5 Ton Worm	0.281 (6:1)	30:1 Net	42:1 Net	60:1 Net
1 HP Lifting Capacity	(lbs)	2211 lbs	3316 lbs	4528 lbs
1.5 HP Lifting Capacity	(lbs)	3316 lbs	4972 lbs	6822 lbs
2 HP Lifting Capacity	(lbs)	4422 lbs	6633 lbs	9097 lbs
Travel Speed	Efficiency	21.26 in/min	15.18 in/min	10.62 in/min
076K69 – 11 Ton Worm	0.272 (8:1)	40:1 Net	56:1 Net	80:1 Net
1 HP Lifting Capacity	(lbs)	1431 lbs	2146 lbs	2943 lbs
1.5 HP Lifting Capacity	(lbs)	2146 lbs	3219 lbs	4414 lbs
2 HP Lifting Capacity	(lbs)	2861 lbs	4292 lbs	5886 lbs
3 HP Lifting Capacity	(lbs)	4292 lbs	6438 lbs	8829 lbs
5 HP Lifting Capacity	(lbs)	7153 lbs	10730 lbs	14715 lbs

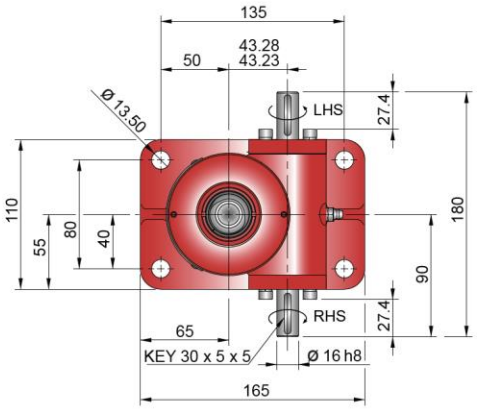
Stainless Spiral Bevel Gear [SsB] LEAD 1

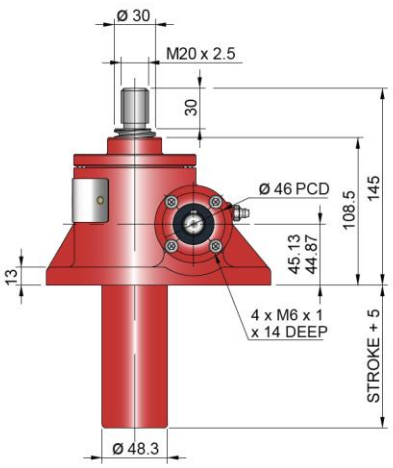
Option 1 LEAD DATA		Side Drive 1:1 Ratio	Side Drive 1.5:1 Ratio	Side Drive 2:1 Ratio	Side Drive 3:1 Ratio	Side Drive 4:1 Ratio	Side Drive 5:1 Ratio	Side Drive 10:1 Ratio
Travel Speed	Efficiency	70.85 in/min	47.23 in/min	35.43 in/min	23.62 in/min	17.71 in/min	14.17 in/min	7.09 in/min
110SsB – 2.8 Ton Bevel	0.264 (6:1)	6:1 Net	9:1 Net	12:1 Net	18:1 Net	24:1 Net	30:1 Net	60:1 Net
3/4 HP Lifting Capacity	(lbs)	530 lbs	794 lbs	1059 lbs	1589 lbs	2118 lbs	2648 lbs	3813 lbs
1 HP Lifting Capacity	(lbs)	706 lbs	1059 lbs	1412 lbs	2118 lbs	2824 lbs	3530 lbs	5084 lbs
Travel Speed	Efficiency	106.28 in/min	70.85 in/min	53.15 in/min	34.43 in/min	26.57 in/min	21.26 in/min	10.64 in/min
140SsB – 5.5 Ton Bevel	0.281 (6:1)	6:1 Net	9:1 Net	12:1 Net	18:1 Net	24:1 Net	30:1 Net	60:1 Net
1 HP Lifting Capacity	(lbs)	663 lbs	995 lbs	1327 lbs	1990 lbs	2653 lbs	3317 lbs	6633 lbs
1.5 HP Lifting Capacity	(lbs)	995 lbs	1493 lbs	1990 lbs	2985 lbs	3980 lbs	4975 lbs	9950 lbs
2 HP Lifting Capacity	(lbs)	1327 lbs	1990 lbs	2653 lbs	3980 lbs	5307 lbs	6633 lbs	NA
Travel Speed	Efficiency	106.28 in/min	70.85 in/min	53.15 in/min	34.43 in/min	26.57 in/min	21.26 in/min	10.64 in/min
170SsB – 11 Ton Bevel	0.272 (8:1)	8:1 Net	12:1 Net	16:1 Net	24:1 Net	32:1 Net	40:1 Net	80:1 Net
1.5 HP Lifting Capacity	(lbs)	1371 lbs	2056 lbs	2741 lbs	4112 lbs	5482 lbs	6853 lbs	13706 lbs
2 HP Lifting Capacity	(lbs)	1827 lbs	2741 lbs	3655 lbs	5482 lbs	7310 lbs	9137 lbs	18275 lbs
3 HP Lifting Capacity	(lbs)	2741 lbs	4112 lbs	5482 lbs	8224 lbs	10965 lbs	13706 lbs	NA
5 HP Lifting Capacity	(lbs)	4569 lbs	6853 lbs	9137 lbs	13706 lbs	18275 lbs	NA	NA

FANGTOOTH SCREW JACK DIMENSIONS

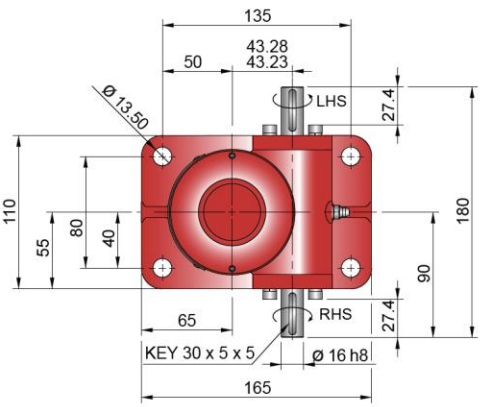
2.8 Ton Steel Machine Screw TRANSLATING

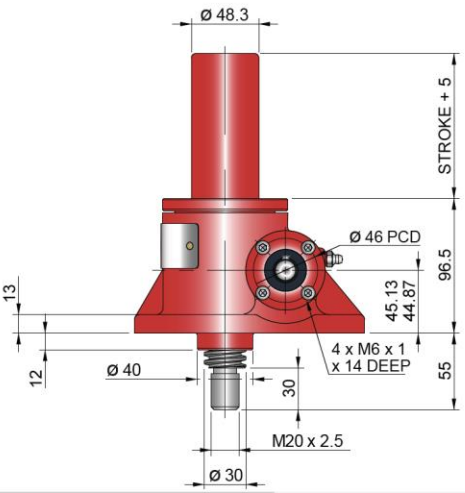
Upright EMT0025-U00





Inverted EMT0025-I00





Order Code: **EMT0025-U1100-0305-EB00-0000**

Lead Opt 1: **EMT0025-I1100-0305-EB00-0000**

Rise (mm)

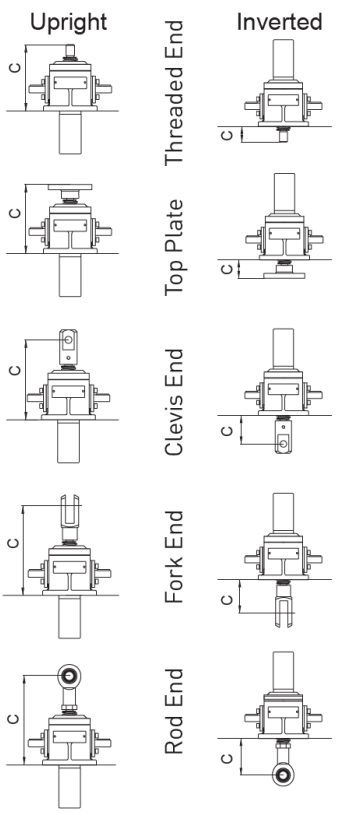
Performance

Model			EMT0025 EMR0025	
Capacity	kN		25	
Lifting Screw	Diameter (mm)		30	
	Lead	Option	1	2
		mm	6	12
Gear Ratio Option 1	Gear Ratio		6:1	
	Static Efficiency		0.201	0.302
	Dynamic Efficiency		0.264	0.383
Gear Ratio Option 2	Gear Ratio		24:1	
	Static Efficiency		0.115	0.171
	Dynamic Efficiency		0.167	0.242
Max. Input power (kW)	Gear Ratio Option 1		1.5	
	Gear Ratio Option 2		0.375	
Start up torque at full load (Nm)	Gear Ratio Option 1		19.8	26.3
	Gear Ratio Option 2		8.7	11.6

Model			EMT0025 EMR0025	
Capacity	kN		25	
Lifting Screw Lead (mm)			6	12
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1mm	2mm
	Gear Ratio 2	4 Turn	1mm	2mm
Maximum Through Torque (Nm)			59	
Lifting Screw Restraining Torque (Nm)			76	102
Worm Shaft Maximum Radial Load (N)			380	
Maximum Input Speed (rpm)			1800	
Gear Case Material			Aluminium	
Weight (kg) - stroke = 150mm			EMT	8.45
			EMR	8.85
Weight (kg) - per extra 25mm stroke			EMT	0.21
			EMR	0.11

Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice

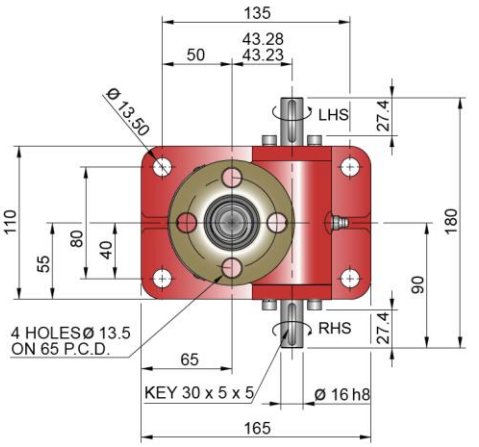
Closed Height

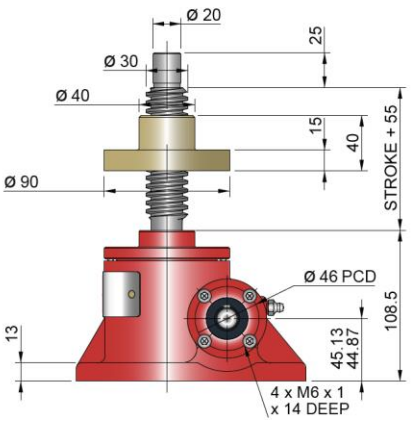


FANGTOOTH SCREW JACK DIMENSIONS

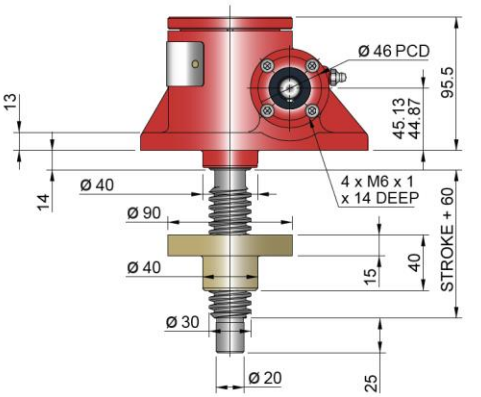
2.8 Ton Steel Machine Screw TRAVELING NUT

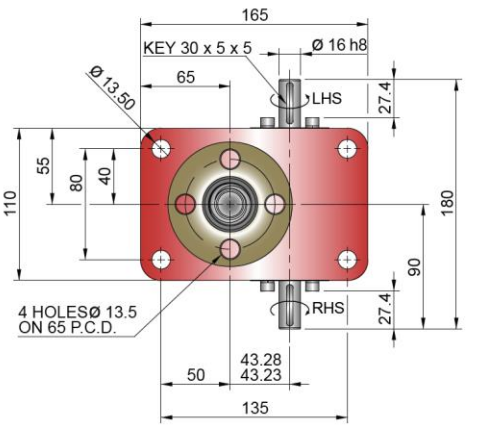
Upright EMR0025-U00





Inverted EMR0025-I00





Order Code: **EMR0025-U1100-0305-PB00-0000**

Lead Opt 1: **EMR0025-I1100-0305-PB00-0000**

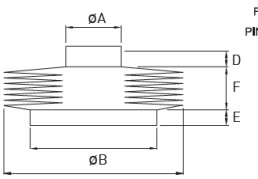
Rise (mm)

Closed Height & Bellows Boots

Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0025	145	55	145	55	170	80	194	104	190	100
Stroke (mm)	EMT0025 with Bellows Boots									
1-300	145	80	145	80	170	105	194	129	205	140
301-600	145	80	145	80	170	105	194	129	205	140
601-1050	170	105	170	105	195	130	219	154	230	165
1051-1500	195	130	195	130	220	155	244	179	255	190

Model	A	B	D	E	G
EMT0025	40	90	15	23	120

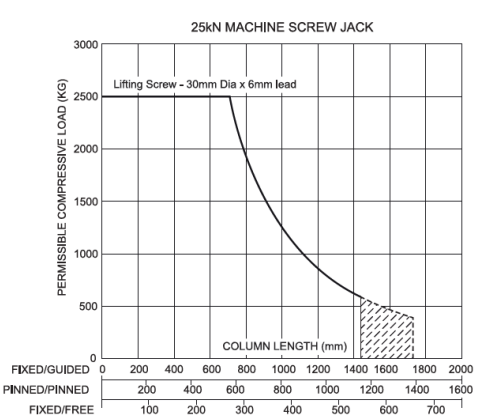
Stroke	1-150	151-301	301-600	601-1050	1051-1500
EMT0025	8	20	30	50	70

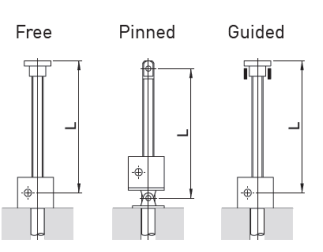


Note:

1. Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
2. Inverted Screw Jacks - Recommended bellows boot mounting plate ØB x (E +5mm) thick.
3. Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
4. † Control tapes fitted (increase outer diameter by 20mm approximately).
5. For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
6. Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
7. Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.

Column Strength

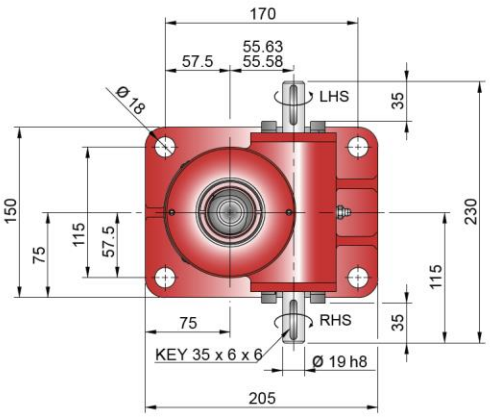


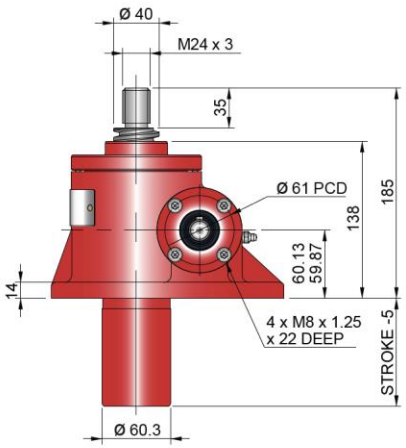


FANGTOOTH SCREW JACK DIMENSIONS

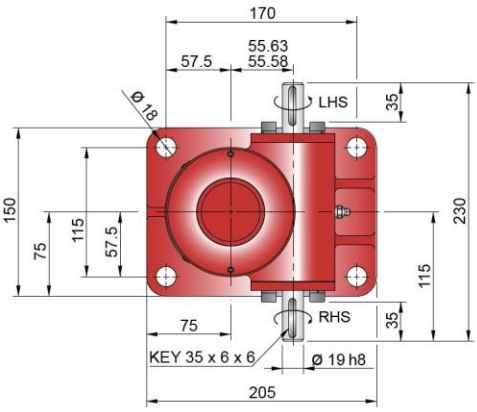
5.5 Ton Steel Machine Screw TRANSLATING

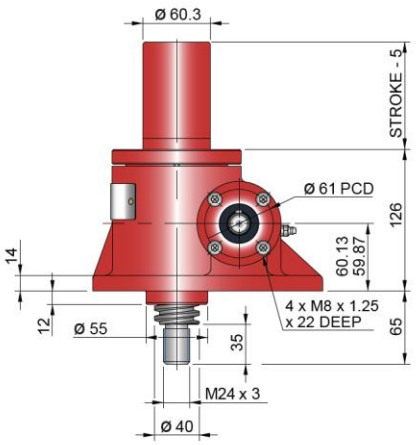
Upright EMT0050-U00





Inverted EMT0050-I00





Order Code: **EMT0050-U1100-0305-EB00-0000**

Lead Opt 1: **EMT0050-I1100-0305-EB00-0000**

Rise (mm)

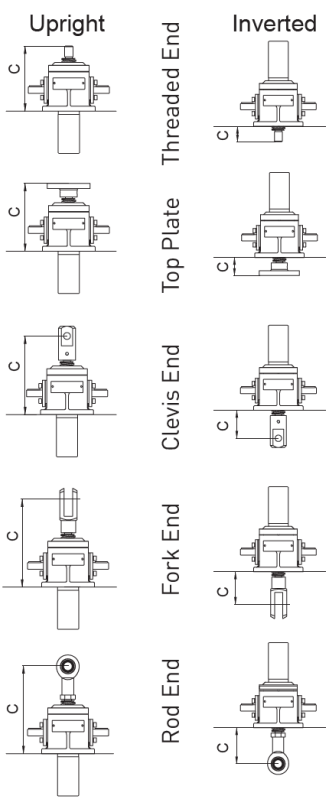
Performance

Model			EMT0050 EMR0050	
Capacity	kN		50	
Lifting Screw	Diameter (mm)		40	
	Lead	Option	1	2
		mm	9	18
Gear Ratio Option 1	Gear Ratio		6:1	
	Static Efficiency		0.213	0.314
	Dynamic Efficiency		0.281	0.398
Gear Ratio Option 2	Gear Ratio		24:1	
	Static Efficiency		0.117	0.172
	Dynamic Efficiency		0.172	0.244
Max. Input power (kW)	Gear Ratio Option 1		3.0	
	Gear Ratio Option 2		0.55	
Start up torque at full load (Nm)	Gear Ratio Option 1		56	76
	Gear Ratio Option 2		25.5	34.7

Model			EMT0050 EMR0050	
Capacity	kN		50	
Lifting Screw (mm)			9	18
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1.5mm	3mm
	Gear Ratio 2	4 Turn	1.5mm	3mm
Maximum Through Torque (Nm)			168	
Lifting Screw Restraining Torque (Nm)			210	290
Worm Shaft Maximum Radial Load (N)			740	
Maximum Input Speed (rpm)			1800	
Gear Case Material			SG Iron	
Weight (kg) - stroke = 150mm			EMT	14.9
			EMR	16.54
Weight (kg) - per extra 25mm stroke			EMT	0.32
			EMR	0.19

Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice

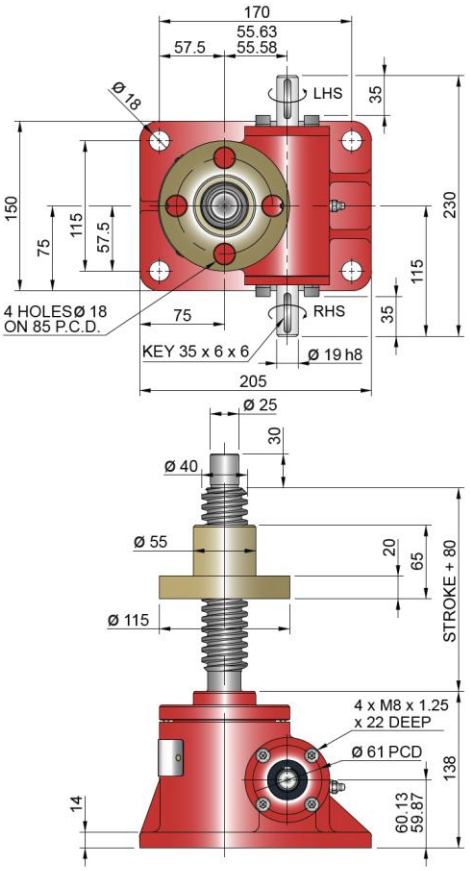
Closed Height



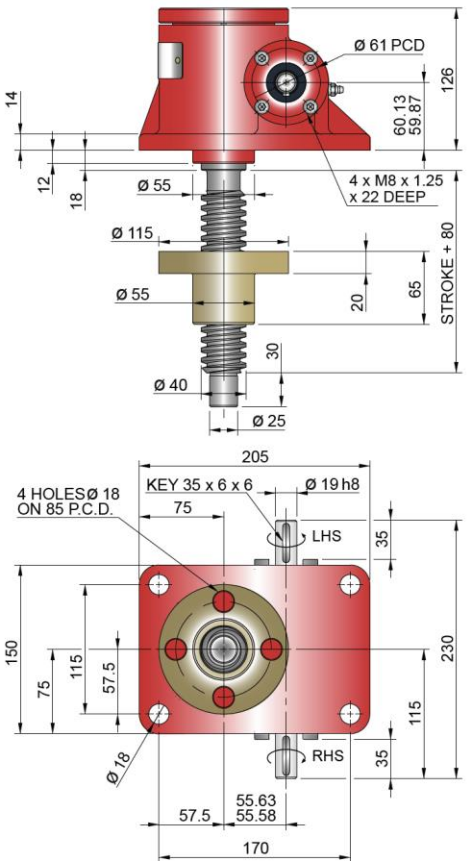
FANGTOOTH SCREW JACK DIMENSIONS

5.5 Ton Steel Machine Screw TRAVELING NUT

Upright EMR0050-U00



Inverted EMR0050-I00



Order Code: **EMR0050-U1100-0305-PB00-0000**

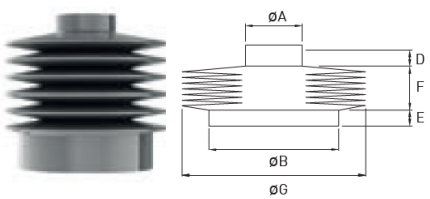
Lead Opt 1: **EMR0050-I1100-0305-PB00-0000**

Rise (mm)

Closed Height & Bellows Boots

Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0050	185	65	185	65	210	90	248	128	242	122
Stroke (mm)	EMT0050 with Bellows Boots									
1-150	185	110	185	110	210	135	248	173	257	182
151-300	185	120	185	120	210	145	248	183	257	192
301-600	210	130	210	130	235	155	273	193	282	202
601-1050	210	150	210	150	235	175	273	213	282	222
1051-1500	235	170	235	170	260	195	298	233	307	242

Model	A	B	D	E	G
EMT0050	50	115	15	31	140

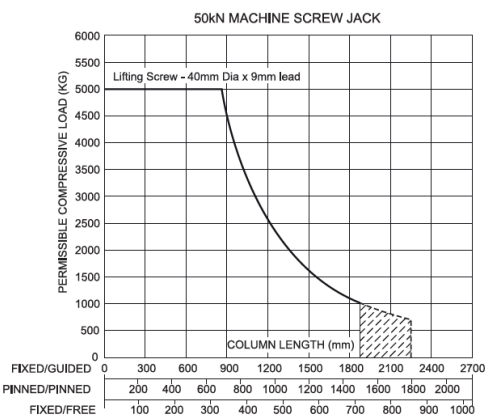


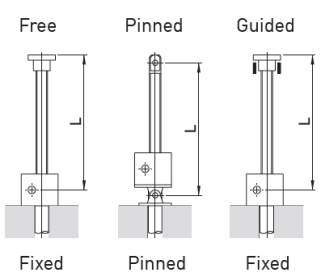
Stroke	1-150	151-300	301-600	601-1050	1051-1500
EMT0050	8	20	30	50	70

Note:

1. Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
2. Inverted Screw Jacks - Recommended bellows boot mounting plate ØB x (E +5mm) thick.
3. Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
4. † Control tapes fitted (increase outer diameter by 20mm approximately).
5. For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
6. Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
7. Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.

Column Strength

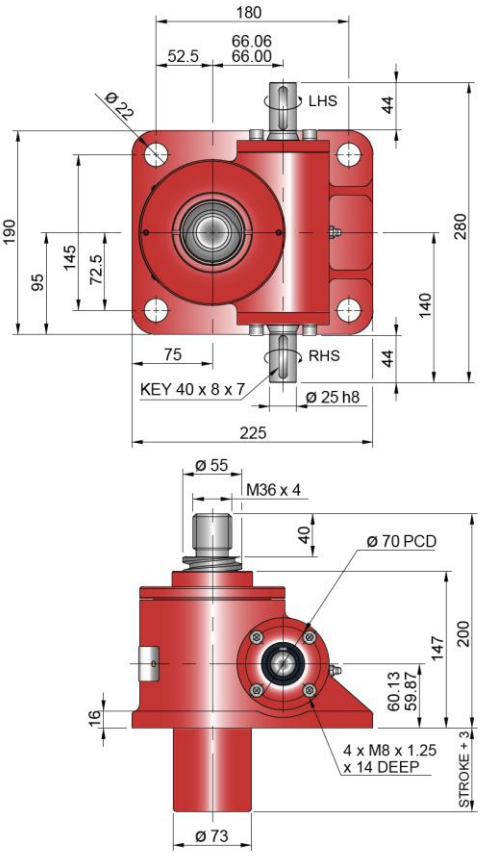




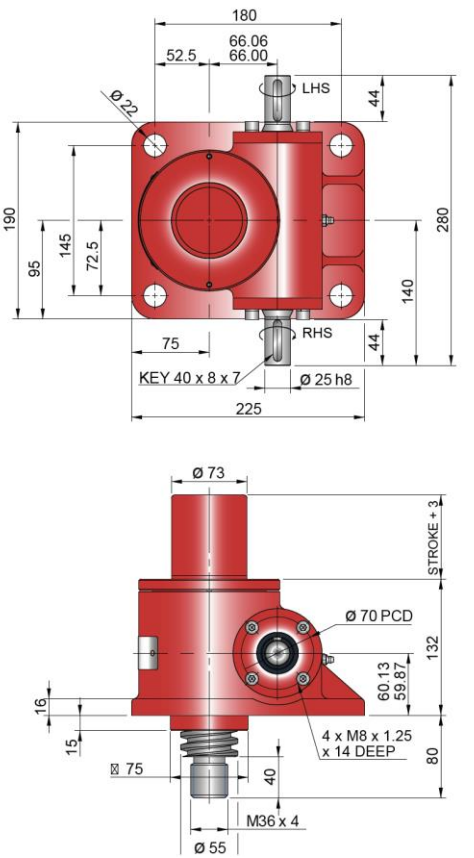
FANGTOOTH SCREW JACK DIMENSIONS

11.0 Ton Steel Machine Screw TRANSLATING

Upright EMT0100-U00



Inverted EMT0100-I00



Order Code: **EMT0100-U1100-0305-EB00-0000**

Lead Opt 1: **EMT0100-I1100-0305-EB00-0000**

Rise (mm)

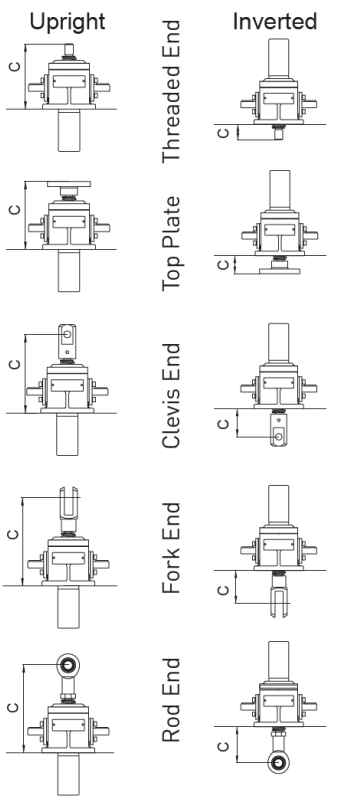
Performance

Model			EMT0100 EMR0100	
Capacity	kN		100	
Lifting Screw	Diameter (mm)		55	
	Lead	Option	1	2
		mm	12	24
Gear Ratio Option 1	Gear Ratio		8:1	
	Static Efficiency		0.206	0.305
	Dynamic Efficiency		0.272	0.388
Gear Ratio Option 2	Gear Ratio		24:1	
	Static Efficiency		0.132	0.195
	Dynamic Efficiency		0.190	0.271
Max. Input power (kW)	Gear Ratio Option 1		3.75	
	Gear Ratio Option 2		1.125	
Start up torque at full load (Nm)	Gear Ratio Option 1		115.9	156.5
	Gear Ratio Option 2		60.5	81.8

Model			EMT0100 EMR0100	
Capacity	kN		100	
Lifting Screw (mm)			12	24
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1.5mm	3mm
	Gear Ratio 2	4 Turn	2mm	4mm
Maximum Through Torque (Nm)			347	
Lifting Screw Restraining Torque (Nm)			575	780
Worm Shaft Maximum Radial Load (N)			1000	
Maximum Input Speed (rpm)			1800	
Gear Case Material			SG Iron	
Weight (kg) - stroke = 150mm			EMT	24.3
			EMR	28.8
Weight (kg) - per extra 25mm stroke			EMT	0.58
			EMR	0.36

Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice

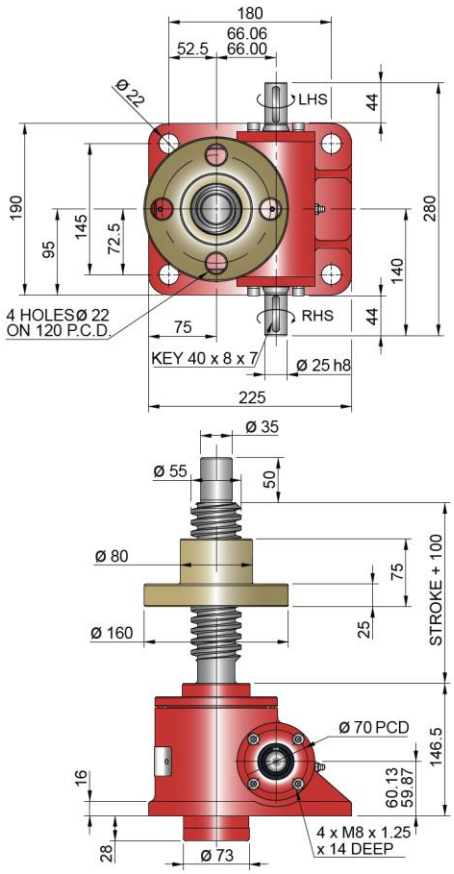
Closed Height



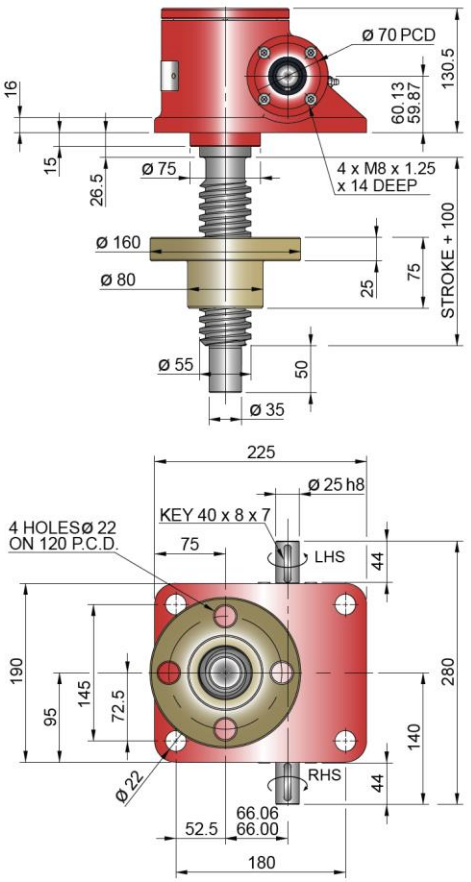
FANGTOOTH SCREW JACK DIMENSIONS

11.0 Ton Steel Machine Screw TRAVELING NUT

Upright EMR0100-U00



Inverted EMR0100-I00



Order Code: **EMR0100-U1100-0305-PB00-0000**

Lead Opt 1: **EMR0100-I1100-0305-PB00-0000**

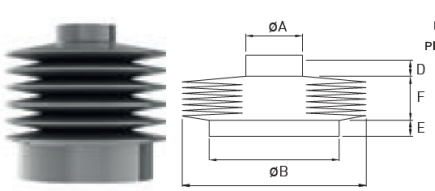
Rise (mm)

Closed Height & Bellows Boots

Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0100	200	80	200	80	245	125	302	182	283	163
Stroke (mm)	EMT0100 with Bellows Boots									
1-300	200	105	200	105	245	150	302	207	298	203
301-600	200	130	200	130	245	175	302	232	298	228
601-1050	225	130	225	130	270	175	327	232	323	228
1051-1500	250	155	250	155	295	200	352	257	348	253

Model	A	B	D	E	G
EMT0100	65	136	15	31	150

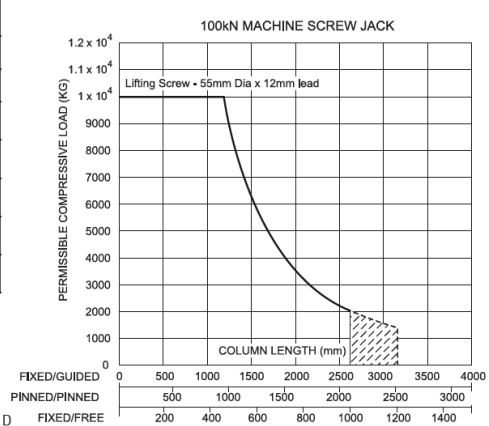
Stroke	1-300	301-600	601-1050	1051-1500
EMT0100	20	30	50	70

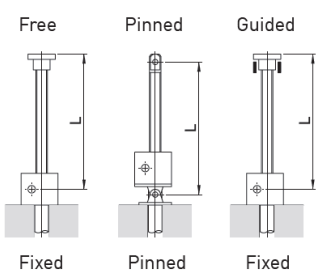


Note:

1. Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
2. Inverted Screw Jacks - Recommended bellows boot mounting plate ØB x (E +5mm) thick.
3. Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
4. † Control tapes fitted (increase outer diameter by 20mm approximately).
5. For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
6. Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
7. Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.

Column Strength

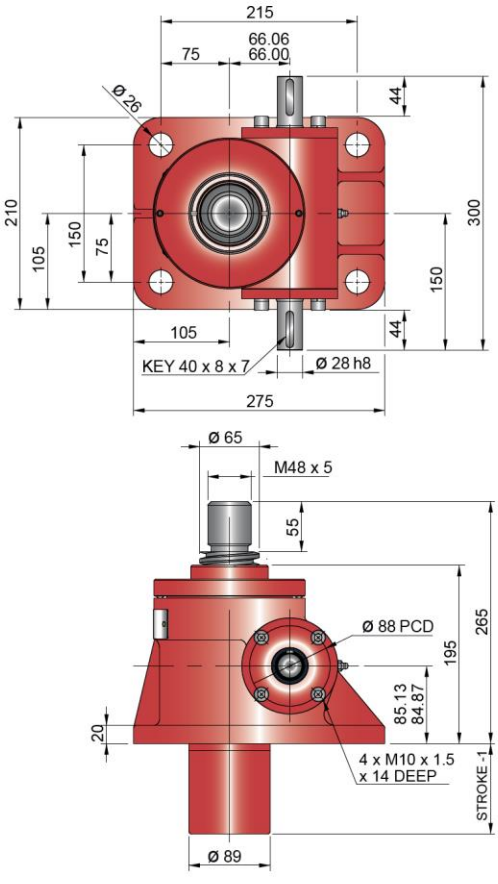




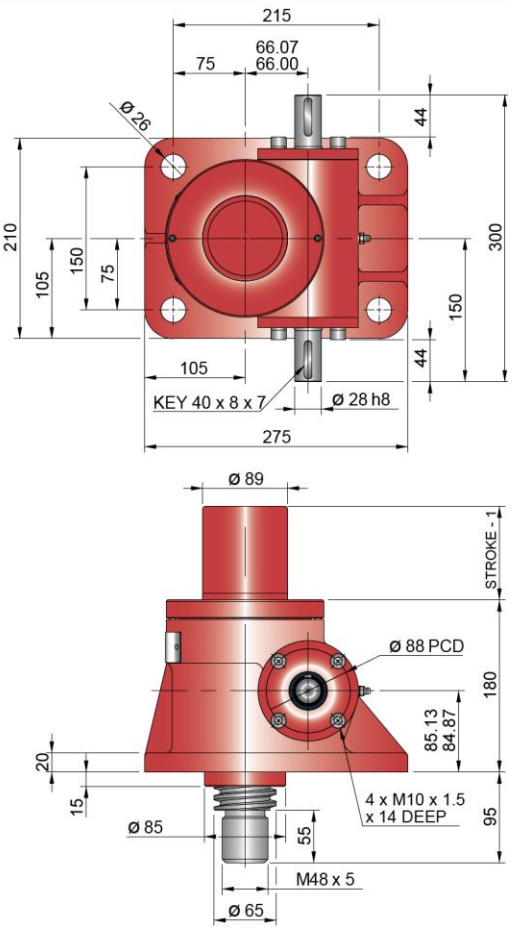
FANGTOOTH SCREW JACK DIMENSIONS

22.5 Ton Steel Machine Screw TRANSLATING

Upright EMT0200-U00



Inverted EMT0200-I00



Order Code: **EMT0200-U1100-0305-EB00-0000**

Lead Opt 1: **EMT0200-I1100-0305-EB00-0000**

Rise (mm)

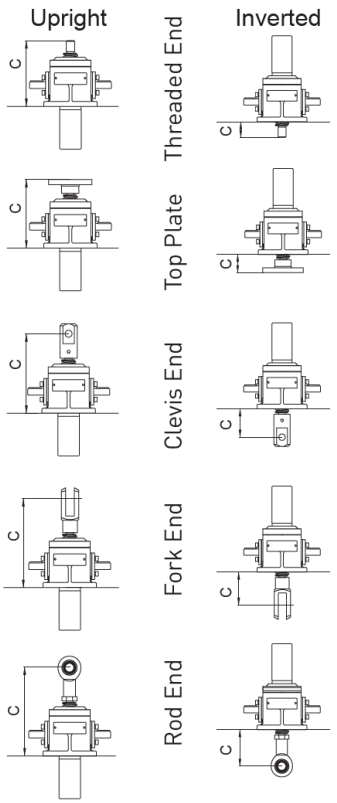
Performance

Model			EMT0200 EMR0200	
Capacity	kN		200	
Lifting Screw	Diameter (mm)		65	
	Lead	Option	1	2
		mm	12	24
Gear Ratio Option 1	Gear Ratio		8:1	
	Static Efficiency		0.181	0.279
	Dynamic Efficiency		0.242	0.357
Gear Ratio Option 2	Gear Ratio		24:1	
	Static Efficiency		0.116	0.178
	Dynamic Efficiency		0.169	0.250
Max. Input power (kW)	Gear Ratio Option 1		3.75	
	Gear Ratio Option 2		1.125	
Start up torque at full load (Nm)	Gear Ratio Option 1		263.8	343
	Gear Ratio Option 2		137	179

Model			EMT0200 EMR0200	
Capacity	kN		200	
Lifting Screw (mm)			12	24
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1.5mm	3mm
	Gear Ratio 2	4 Turn	2mm	4mm
Maximum Through Torque (Nm)			396	
Lifting Screw Restraining Torque (Nm)			1300	1705
Worm Shaft Maximum Radial Load (N)			1600	
Maximum Input Speed (rpm)			1800	
Gear Case Material			Steel	
Weight (kg) - stroke = 150mm			EMT	42.4
			EMR	49.58
Weight (kg) - per extra 25mm stroke			EMT	0.84
			EMR	0.52

Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice

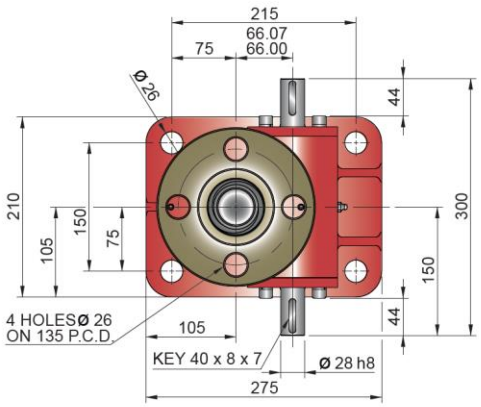
Closed Height

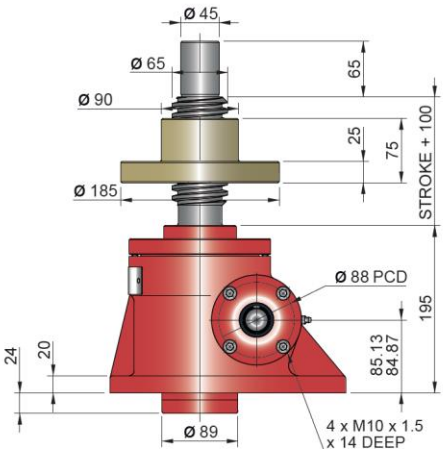


FANGTOOTH SCREW JACK DIMENSIONS

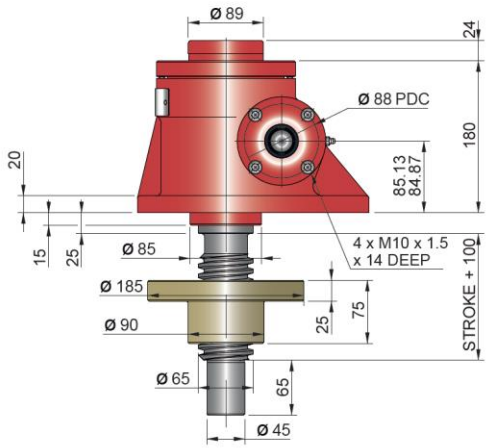
22.5 Ton Steel Machine Screw TRAVELING NUT

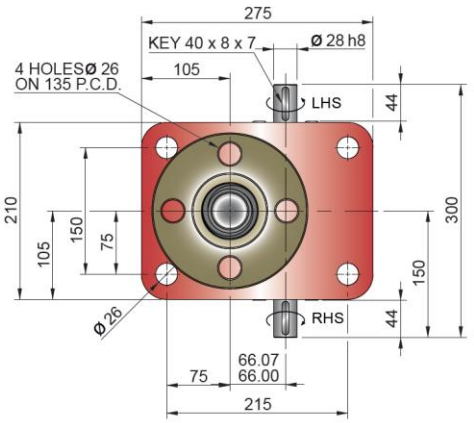
Upright EMR0200-U00





Inverted EMR0200-I00





Order Code: **EMR0200-U1100-0305-PB00-0000**

Lead Opt 1: **EMR0200-I1100-0305-PB00-0000**

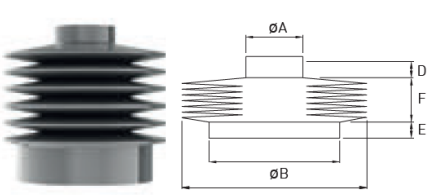
Rise (mm)

Closed Height & Bellows Boots

Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0200	265	95	265	95	310	140	400	230	367	197
Stroke (mm)	EMT0200 with Bellows Boots									
1-300	265	120	265	120	310	165	400	255	387	242
301-600	265	145	265	145	310	190	400	280	387	267
601-1050	290	145	290	145	335	190	425	280	412	267
1051-1500	315	170	315	170	360	215	450	305	437	292

Model	A	B	D	E	G
EMT0200	75	165	20	20	165

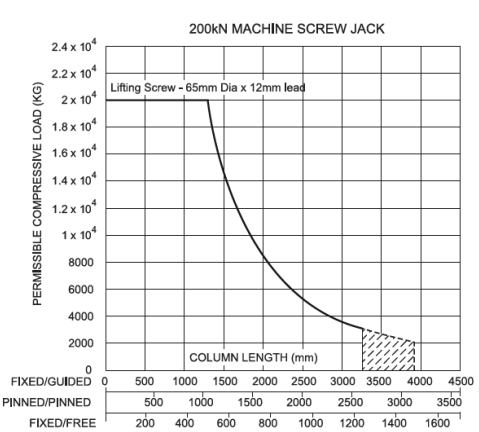
Stroke	1-300	301-600	601-1050	1051-1500
EMT0200	20	30	50	70

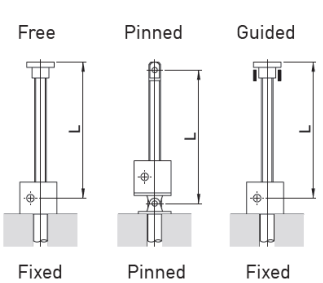


Note:

1. Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
2. Inverted Screw Jacks - Recommended bellows boot mounting plate ØB x (E +5mm) thick.
3. Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
4. † Control tapes fitted (increase outer diameter by 20mm approximately).
5. For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
6. Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
7. Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.

Column Strength





FANGTOOTH SCREW JACK DIMENSIONS

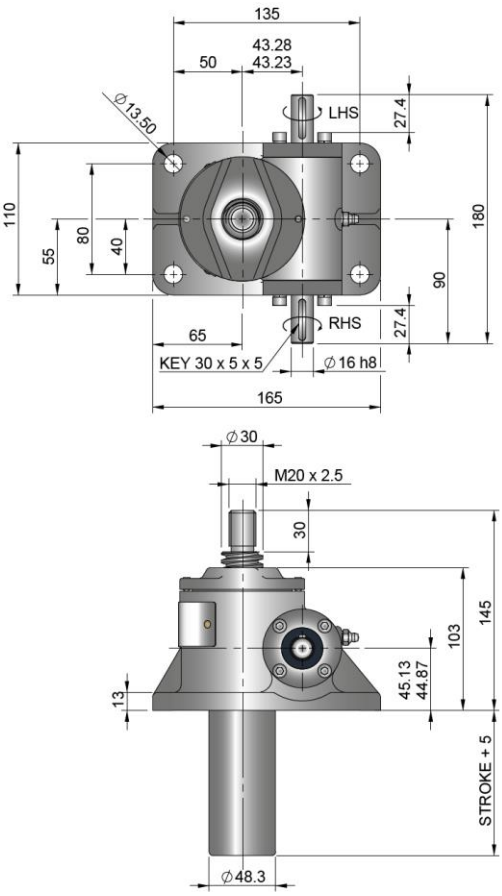
2.8 Ton

Stainless Steel

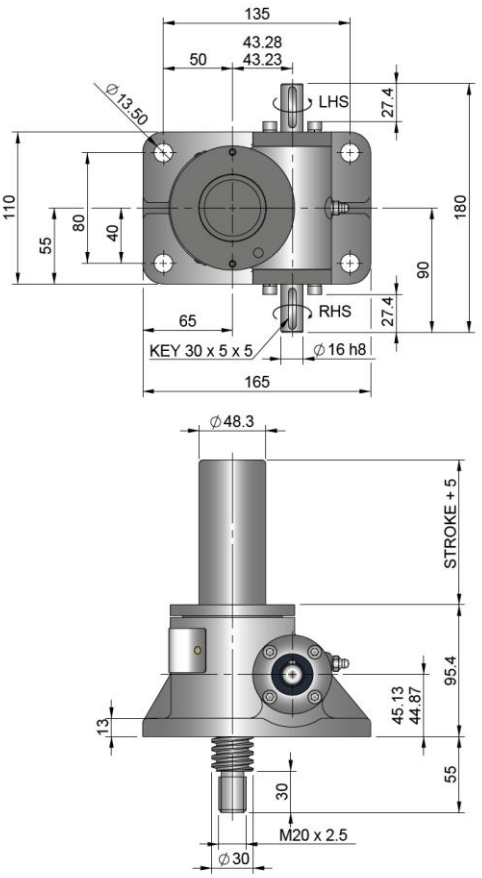
Machine Screw

TRANSLATING

Upright EMT0025-V00



Inverted EMT0025-J00



Order Code: EMT0025-V1100-0305-EB00-000C

Lead Opt 1: EMT0025-J1100-0305-EB00-0000

Rise (mm)

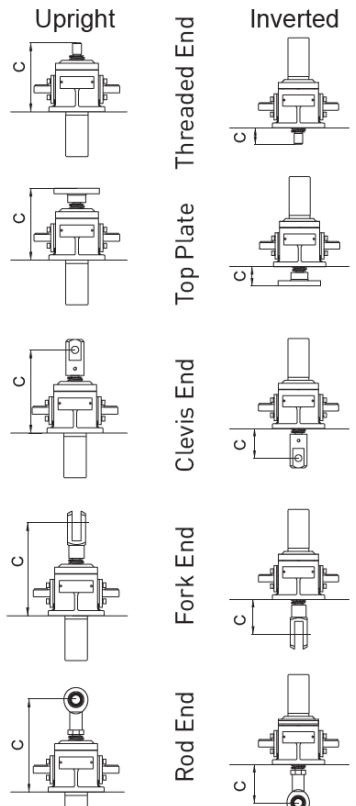
Performance

Model			EMT0025 EMR0025	
Capacity (kN)			25	
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	16.5	
		Compression	25	
	Duplex Lifting Screw		25	
Operating Capacity (kN)	Standard 316 Worm Shaft		8.25	
	Duplex or Plated Worm Shaft with 316 Screw	Tension	16.5	
		Compression	59	
	Duplex or Plated Worm Shaft with Duplex Screw		25	
Lifting Screw	Diameter (mm)		30	
	Lead	Option	1	2
		mm	6	12
Gear Ratio Option 1	Gear Ratio		6:1	
	Screw Jack Static Efficiency		0.201	0.302
	Screw Jack Dynamic Efficiency		0.264	0.383
Gear Ratio Option 2	Gear Ratio		24:1	
	Screw Jack Static Efficiency		0.115	0.171
	Screw Jack Dynamic Efficiency		0.167	0.242

Model			EMT0025 EMR0025	
Capacity	kN		25	
Lifting Screw Lead (mm)			6	12
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1mm	2mm
	Gear Ratio 2	4 Turn	1mm	2mm
Maximum Through Torque (Nm)			59	
Lifting Screw Restraining Torque (Nm)			76	102
Worm Shaft Maximum Radial Load (N)			380	
Maximum Input Speed (rpm)			1800	
Gear Case Material			Stainless Steel	
Weight (kg) - stroke = 150mm			EMT	8.45
			EMR	8.85
Weight (kg) - per extra 25mm stroke			EMT	0.21
			EMR	0.11

Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice

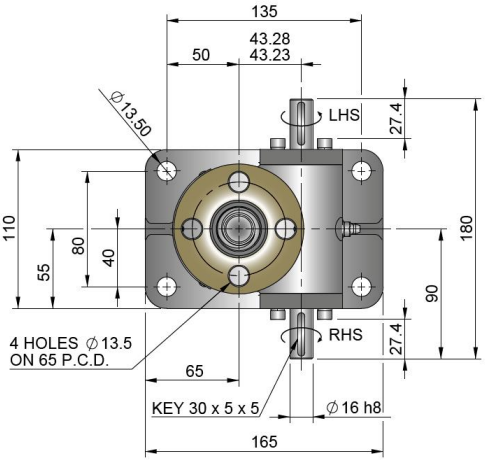
Closed Height

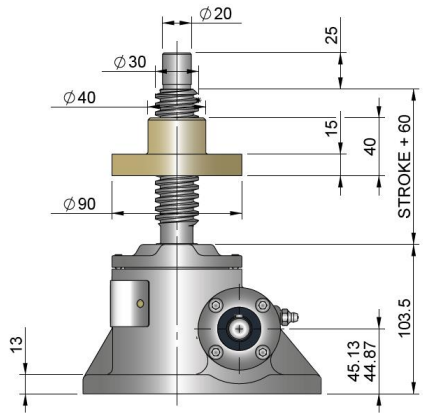


FANGTOOTH SCREW JACK DIMENSIONS

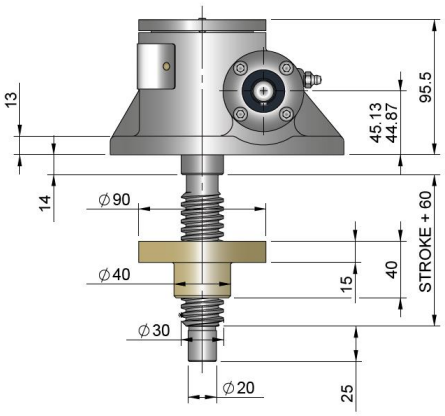
2.8 Ton Stainless Steel Machine Screw TRAVELING NUT

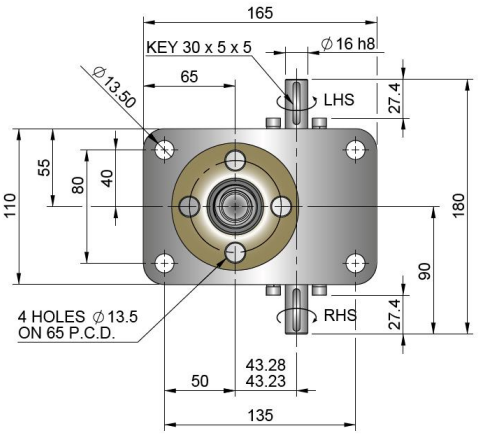
Upright EMR0025-V00





Inverted EMR0025-J00





Order Code: EMR0025-V1100-0305-PB00-0000

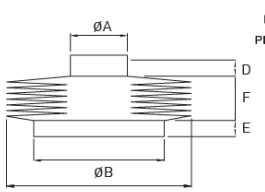
Lead Opt 1: EMR0025-J1100-0305-PB00-0000

Rise (mm)

Closed Height & Bellows Boots

Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0025	145	55	145	55	170	80	194	104	190	100
Stroke (mm)	EMT0025 with Bellows Boots									
1-300	145	80	145	80	170	105	194	129	205	140
301-600	145	105	145	105	170	130	194	154	205	165
601-1050	170	130	170	130	195	155	219	179	230	190
1051-1500	195	130	195	130	220	155	244	179	255	190

Model	A	B	D	E	G
EMT0025	40	90	15	23	120

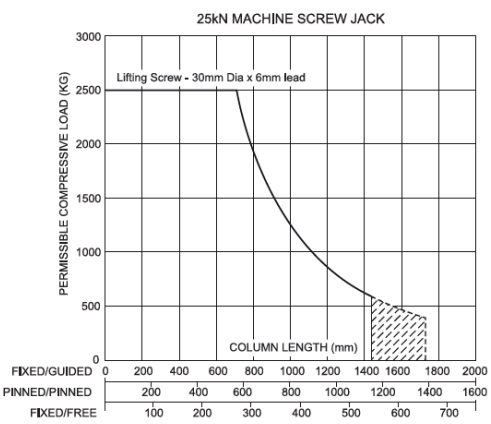


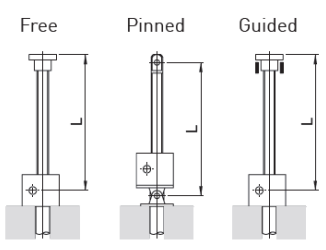
Stroke	1-150	151-301	301-600	601-1050	1051-1500
EMT0025	8	20	30	50	70

Note:

1. Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
2. Inverted Screw Jacks - Recommended bellows boot mounting plate ØB x (E +5mm) thick.
3. Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
4. † Control tapes fitted (increase outer diameter by 20mm approximately).
5. For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
6. Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
7. Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.

Column Strength





FANGTOOTH SCREW JACK DIMENSIONS

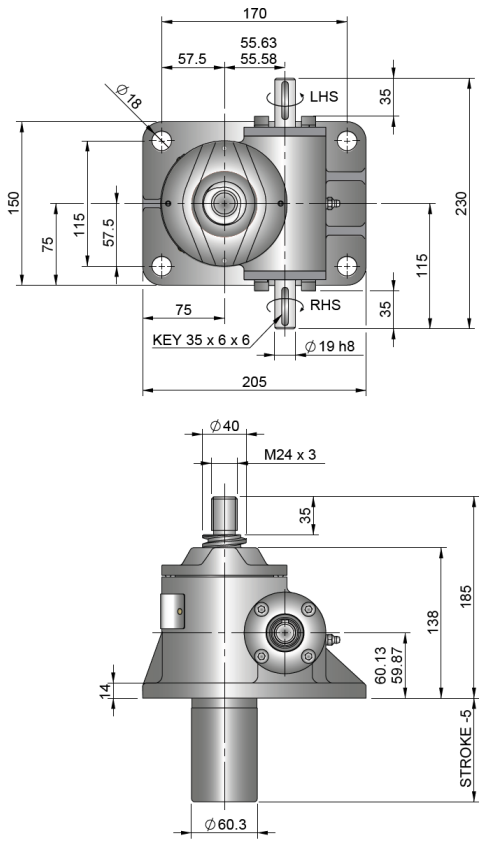
5.5 Ton

Stainless Steel

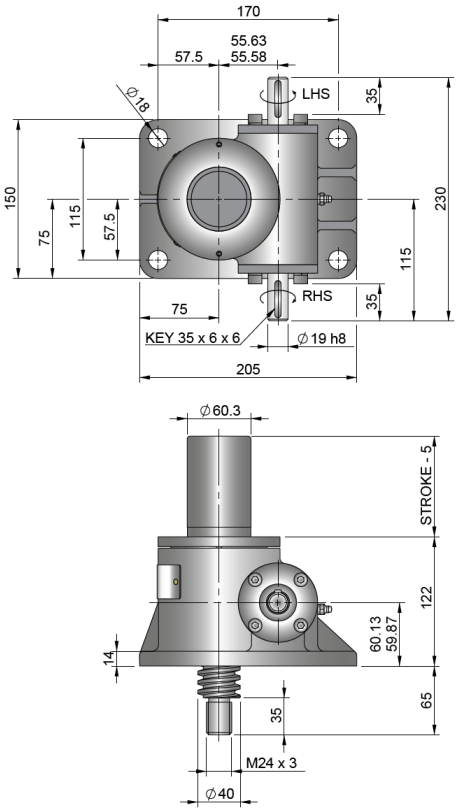
Machine Screw

TRANSLATING

Upright EMT0050-V00



Inverted EMT0050-J00



Order Code: **EMT0050-V1100-0305-EB00-0000**

Lead Opt 1: **EMT0050-J1100-0305-EB00-0000**

Rise (mm)

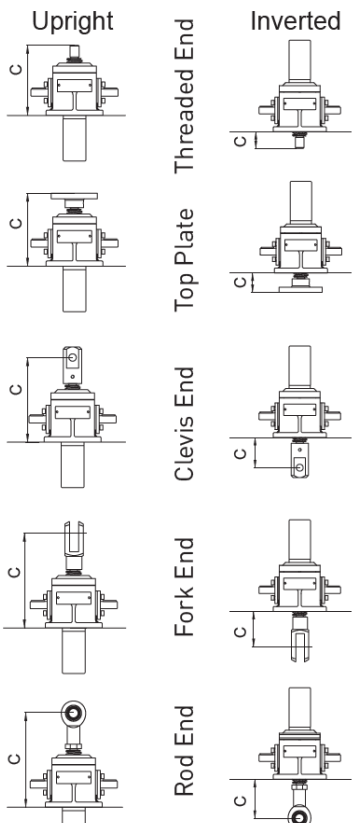
Performance

Model			EMT0050 EMR0050	
Capacity (kN)			50	
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	33	
		Compression	33	
	Duplex Lifting Screw		50	
Operating Capacity (kN)	Standard 316 Worm Shaft		16.5	
	Duplex or Plated Worm Shaft with 316 Screw	Tension	33	
		Compression	50	
	Duplex or Plated Worm Shaft with Duplex Screw		50	
Lifting Screw	Diameter (mm)		40	
	Lead	Option	1	2
		mm	9	18
Gear Ratio Option 1	Gear Ratio		6:1	
	Screw Jack Static Efficiency		0.213	0.314
	Screw Jack Dynamic Efficiency		0.281	0.398
Gear Ratio Option 2	Gear Ratio		24:1	
	Screw Jack Static Efficiency		0.117	0.172
	Screw Jack Dynamic Efficiency		0.172	0.244

Model			EMT0050 EMR0050	
Capacity	kN		50	
Lifting Screw Lead (mm)			9	18
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1.5mm	3mm
	Gear Ratio 2	4 Turn	1.5mm	3mm
Maximum Through Torque (Nm)			168	
Lifting Screw Restraining Torque (Nm)			210	290
Worm Shaft Maximum Radial Load (N)			740	
Maximum Input Speed (rpm)			1800	
Gear Case Material			Stainless Steel	
Weight (kg) - stroke = 150mm			EMT	14.9
			EMR	16.54
Weight (kg) - per extra 25mm stroke			EMT	0.32
			EMR	0.19

Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice

Closed Height



FANGTOOTH SCREW JACK DIMENSIONS

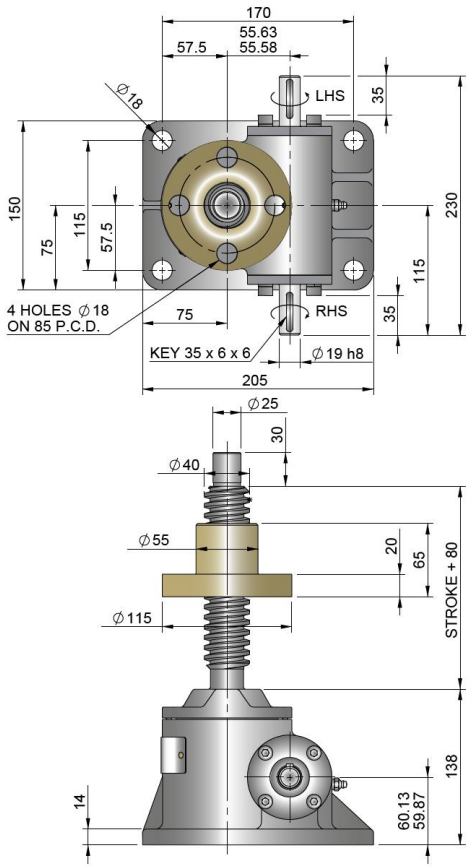
5.5 Ton

Stainless Steel

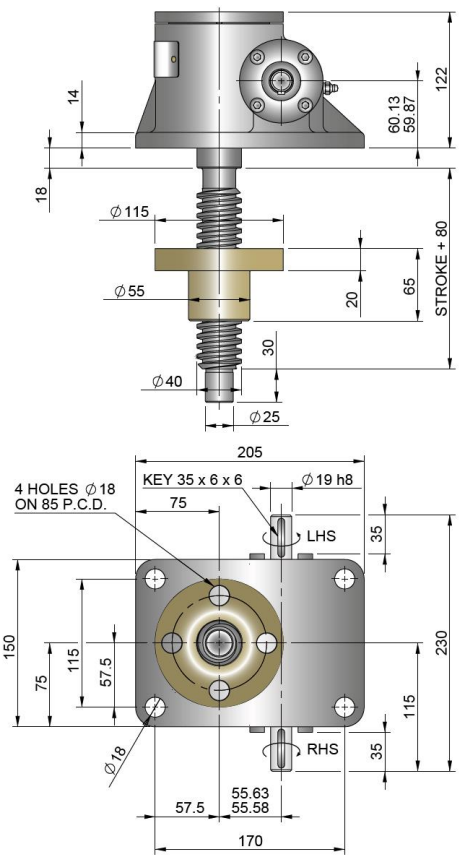
Machine Screw

TRAVELING NUT

Upright EMR0050-V00



Inverted EMR0050-J00



Order Code: **EMR0050-V1100-0305-PB00-0000**

Lead Opt 1: **EMR0050-J1100-0305-PB00-0000**

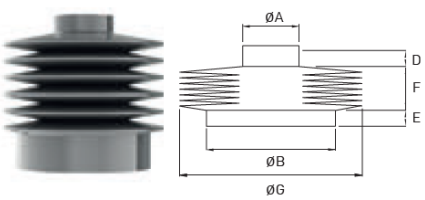
Rise (mm)

Closed Height & Bellows Boots

Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0050	185	65	185	65	210	90	248	128	242	122
Stroke (mm)	EMT0050 with Bellows Boots									
1-150	185	110	185	110	210	135	248	173	257	182
151-300	185	120	185	120	210	145	248	183	257	192
301-600	210	130	210	130	235	155	273	193	282	202
601-1050	210	150	210	150	235	175	273	213	282	222
1051-1500	235	170	235	170	260	195	298	233	307	242

Model	A	B	D	E	G
EMT0050	50	115	15	31	140

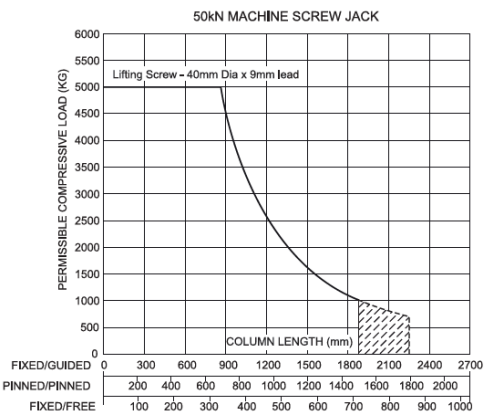
Stroke	1-150	151-300	301-600	601-1050	1051-1500
EMT0050	8	20	30	50	70

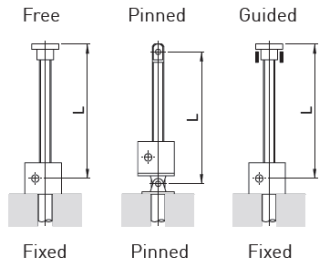


Note:

1. Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
2. Inverted Screw Jacks - Recommended bellows boot mounting plate ØB x (E +5mm) thick.
3. Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
4. † Control tapes fitted (increase outer diameter by 20mm approximately).
5. For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
6. Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
7. Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.

Column Strength





FANGTOOTH SCREW JACK DIMENSIONS

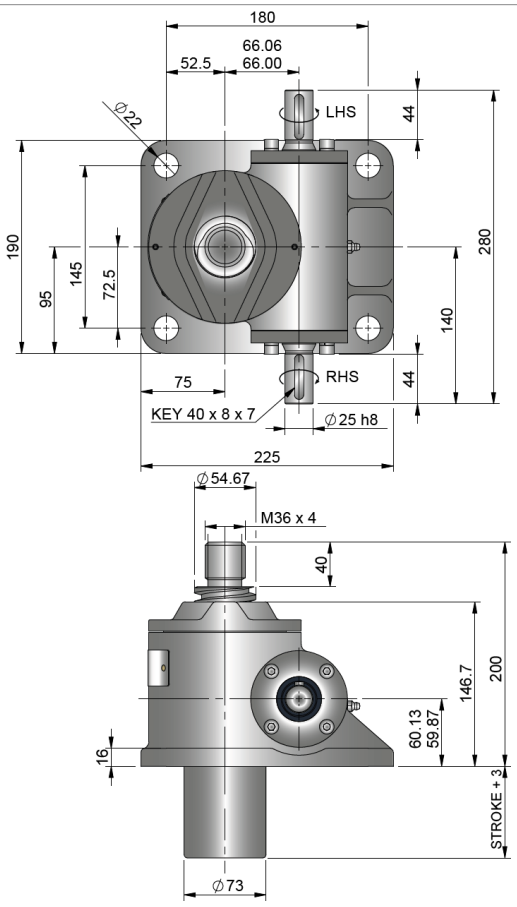
11.0 Ton

Stainless Steel

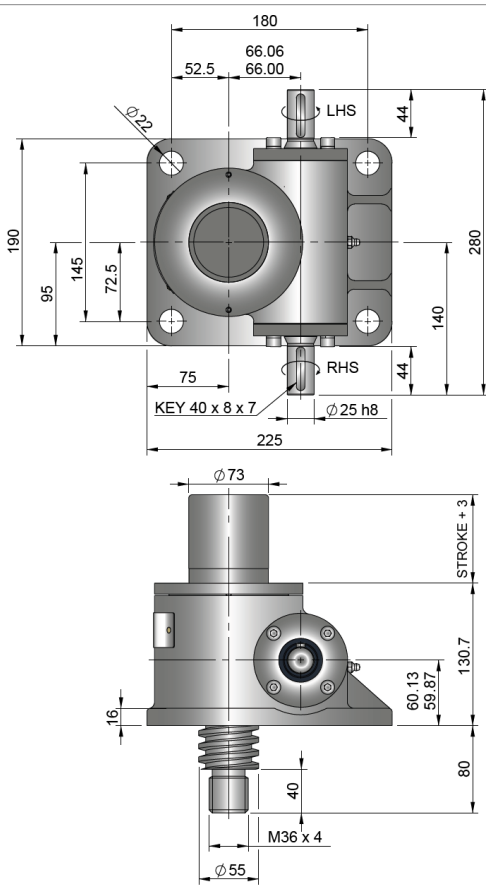
Machine Screw

TRANSLATING

Upright EMT0100-V00



Inverted EMT0100-J00



Order Code: **EMT0100-V1100-0305-EB00-0000**

Lead Opt 1: **EMT0100-J1100-0305-EB00-0000**

Rise (mm)

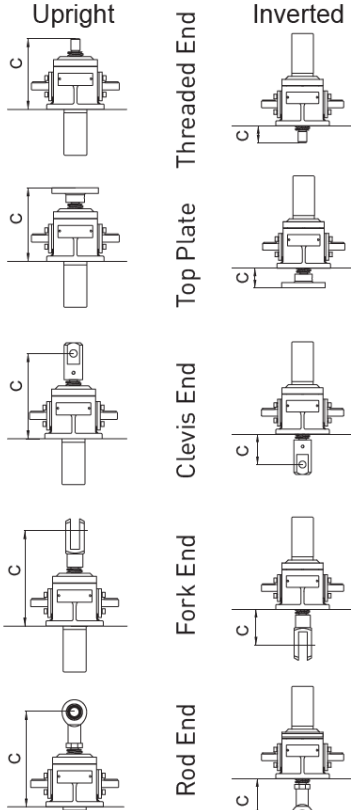
Performance

Model			EMT0100 EMR0100	
Capacity (kN)			100	
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	66	
		Compression	100	
	Duplex Lifting Screw		100	
Operating Capacity (kN)	Standard 316 Worm Shaft		33	
	Duplex or Plated Worm Shaft with 316 Screw	Tension	66	
		Compression	100	
	Duplex or Plated Worm Shaft with Duplex Screw		100	
Lifting Screw	Diameter (mm)		55	
	Lead	Option	1	2
		mm	12	24
Gear Ratio Option 1	Gear Ratio		8:1	
	Screw Jack Static Efficiency		0.206	0.305
	Screw Jack Dynamic Efficiency		0.272	0.388
Gear Ratio Option 2	Gear Ratio		24:1	
	Screw Jack Static Efficiency		0.132	0.195
	Screw Jack Dynamic Efficiency		0.190	0.271

Model			EMT0100 EMR0100	
Capacity	kN		100	
Lifting Screw Lead (mm)			12	24
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1.5mm	3mm
	Gear Ratio 2	4 Turn	2mm	4mm
Maximum Through Torque (Nm)			347	
Lifting Screw Restraining Torque (Nm)			575	780
Worm Shaft Maximum Radial Load (N)			1000	
Maximum Input Speed (rpm)			1800	
Gear Case Material			Stainless Steel	
Weight (kg) - stroke = 150mm			EMT	24.3
			EMR	28.8
Weight (kg) - per extra 25mm stroke			EMT	0.58
			EMR	0.36

Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice

Closed Height



FANGTOOTH SCREW JACK DIMENSIONS

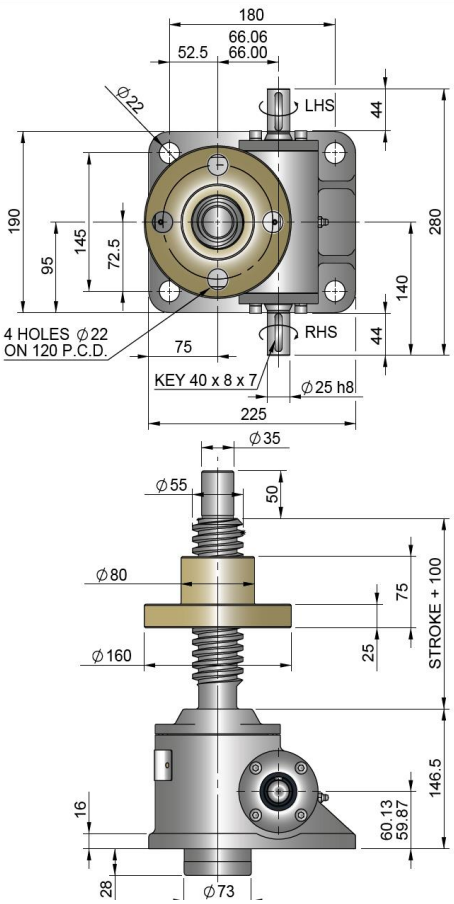
11.0 Ton

Stainless Steel

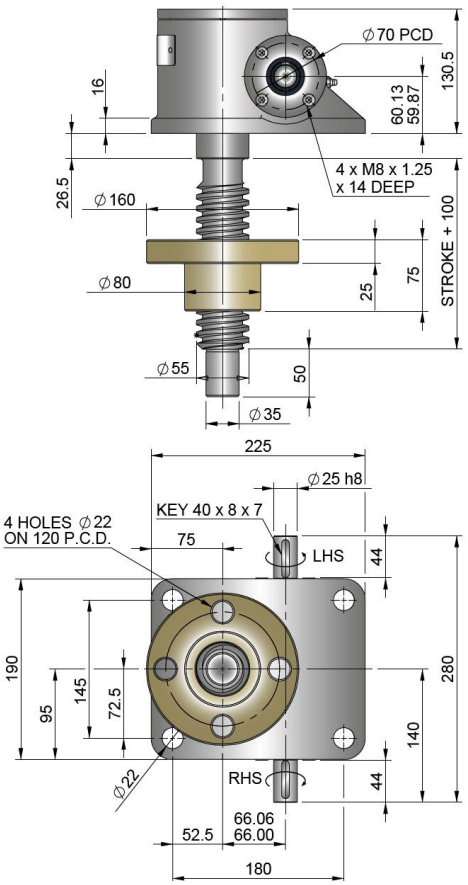
Machine Screw

TRAVELING NUT

Upright EMR0100-V00



Inverted EMR0100-J00



Order Code: **EMR0100-V1100-0305-PB00-0000**

Lead Opt 1: **EMR0100-J1100-0305-PB00-0000**

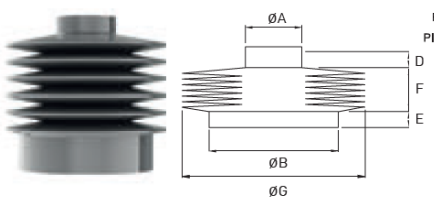
Rise (mm)

Closed Height & Bellows Boots

Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0100	200	80	200	80	245	125	302	182	283	163
Stroke (mm)	EMT0100 with Bellows Boots									
1-300	200	105	200	105	245	150	302	207	298	203
301-600	200	130	200	130	245	175	302	232	298	228
601-1050	225	130	225	130	270	175	327	232	323	228
1051-1500	250	155	250	155	295	200	352	257	348	253

Model	A	B	D	E	G
EMT0100	65	136	15	31	150

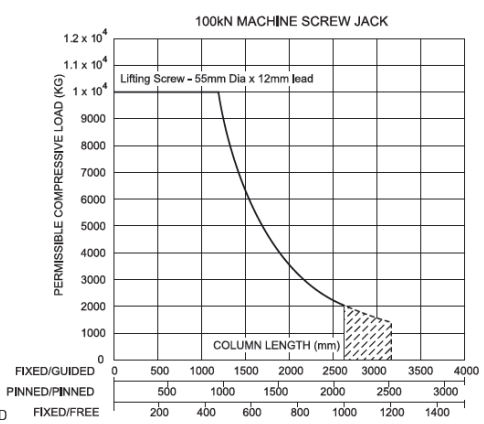
Stroke	1-300	301-600	601-1050	1051-1500
EMT0100	20	30	50	70

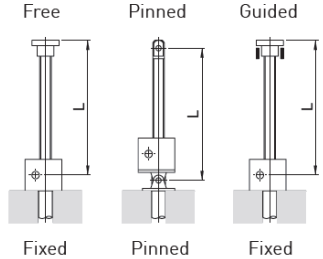


Note:

1. Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
2. Inverted Screw Jacks - Recommended bellows boot mounting plate ØB x (E +5mm) thick.
3. Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
4. † Control tapes fitted (increase outer diameter by 20mm approximately).
5. For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
6. Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
7. Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.

Column Strength





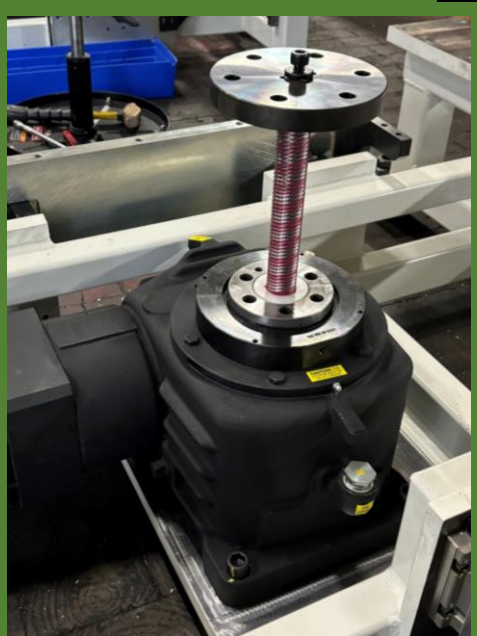
fang TOOTH

High Force Lifting Jacks

NEPTUNE
TRITON

Planetary Lift

Ball Screw Lift

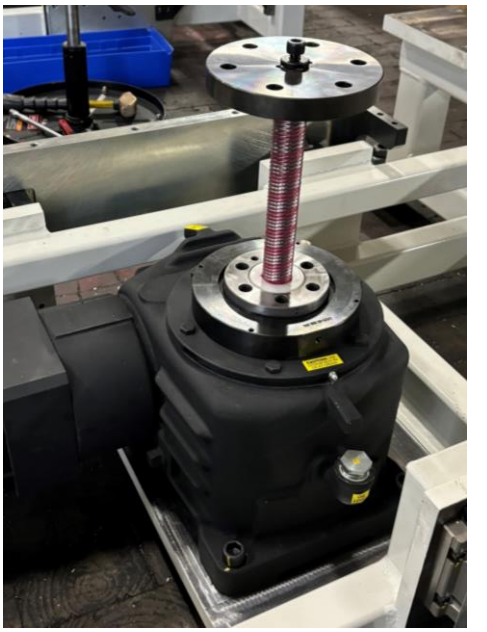


MADE IN USA
LIVONIA MI

www.fangtooth-linear.com

FANGTOOTH TRITON RATINGS

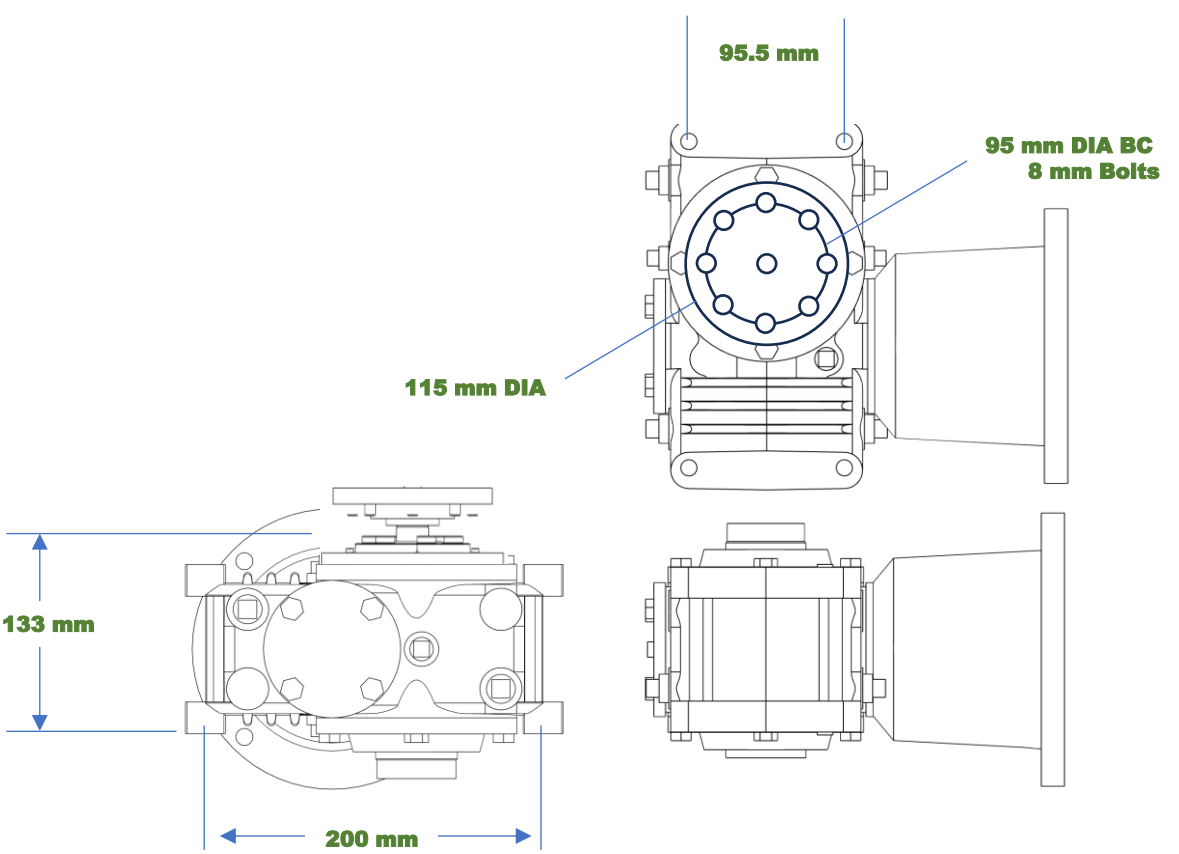
Max Speed is dependent on Mounting Configuration and Length.
Please Call Application Engineering for Advice.



Triton Size 2525-020
Ball Screw Lift

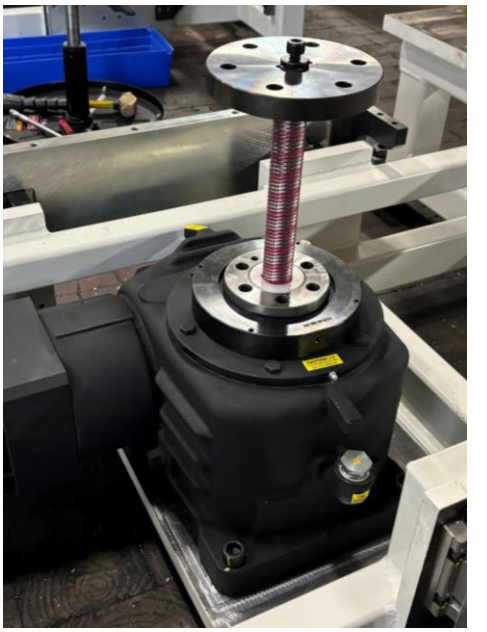
MAX LIFTING CAPACITY 2.0 Tons

	Travel / Turn		Jack Efficiency	
5:1 Gear Ratio	5.000	mm	87.40	%
10:1 Gear Ratio	2.500	mm	81.88	%
20:1 Gear Ratio	1.0	mm	74.52	%
30:1 Gear Ratio	0.833	mm	71.76	%
40:1 Gear Ratio	0.625	mm	64.40	%
50:1 Gear Ratio	0.500	mm	61.64	%



FANGTOOTH TRITON RATINGS

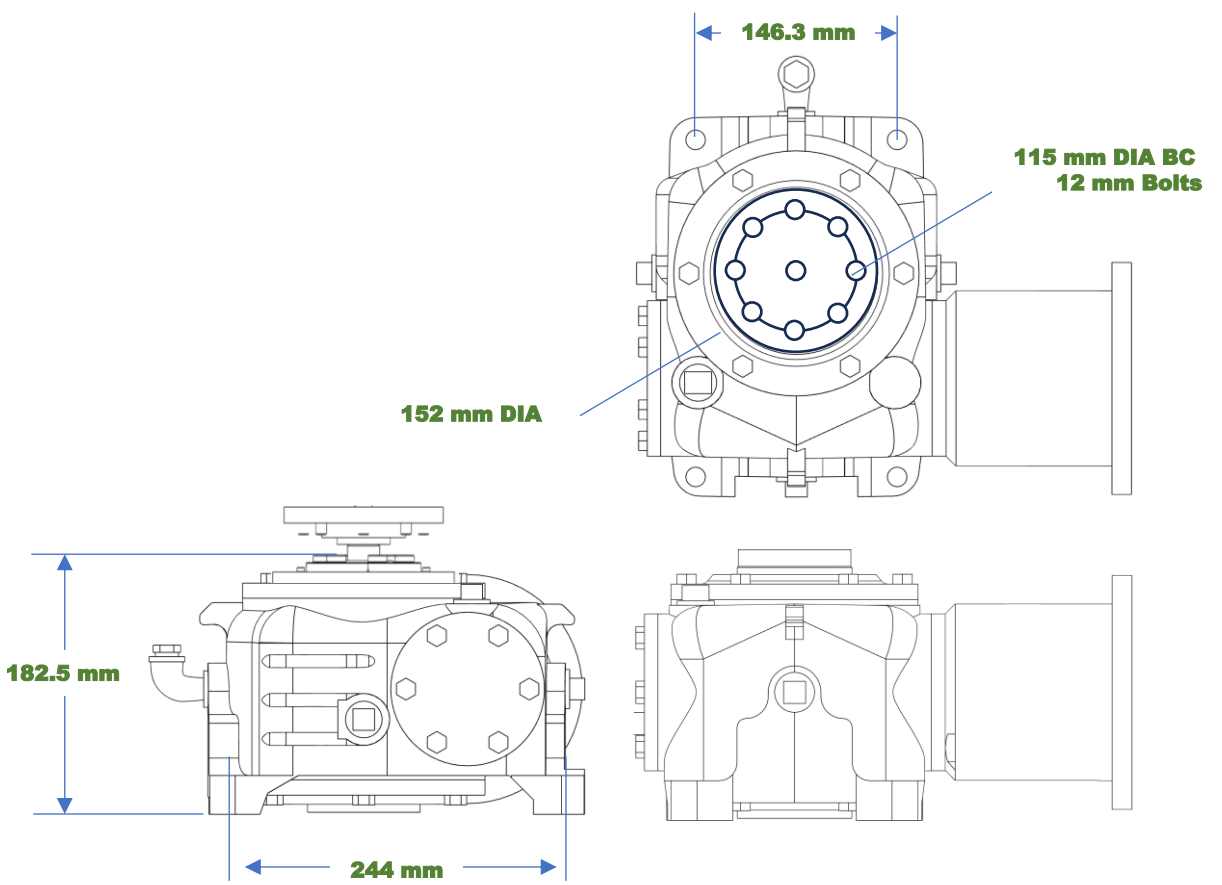
Max Speed is dependent on Mounting Configuration and Length.
Please Call Application Engineering for Advice.



Triton Size 3232-030
Ball Screw Lift

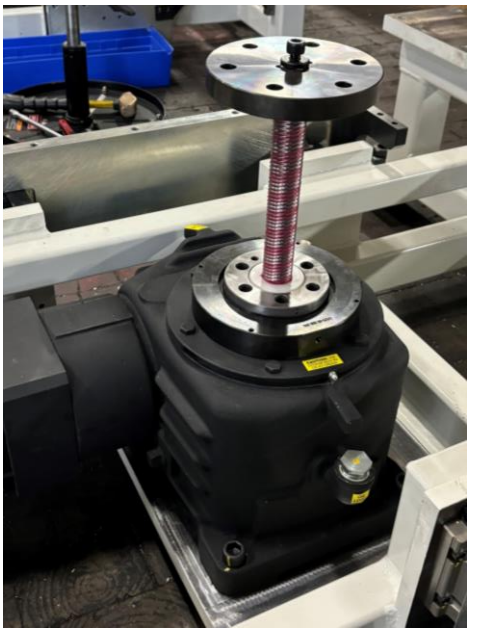
MAX LIFTING CAPACITY 3.0 Tons

	Travel / Turn		Jack Efficiency	
4:1 Gear Ratio	8.000	mm	87.40	%
10:1 Gear Ratio	3.200	mm	81.88	%
20:1 Gear Ratio	1.600	mm	74.52	%
30:1 Gear Ratio	0.938	mm	71.76	%
40:1 Gear Ratio	0.800	mm	64.40	%
50:1 Gear Ratio	0.640	mm	61.64	%



FANGTOOTH NEPTUNE/TRITON RATINGS

Max Speed is dependent on Mounting Configuration and Length.
Please Call Application Engineering for Advice.



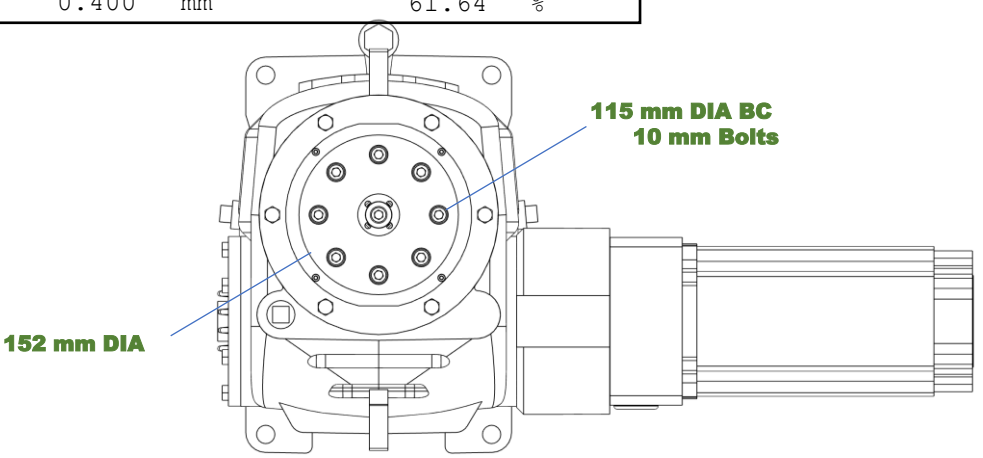
Neptune Size 3020-085
Planetary Roller Screw Lift [Life Boost]

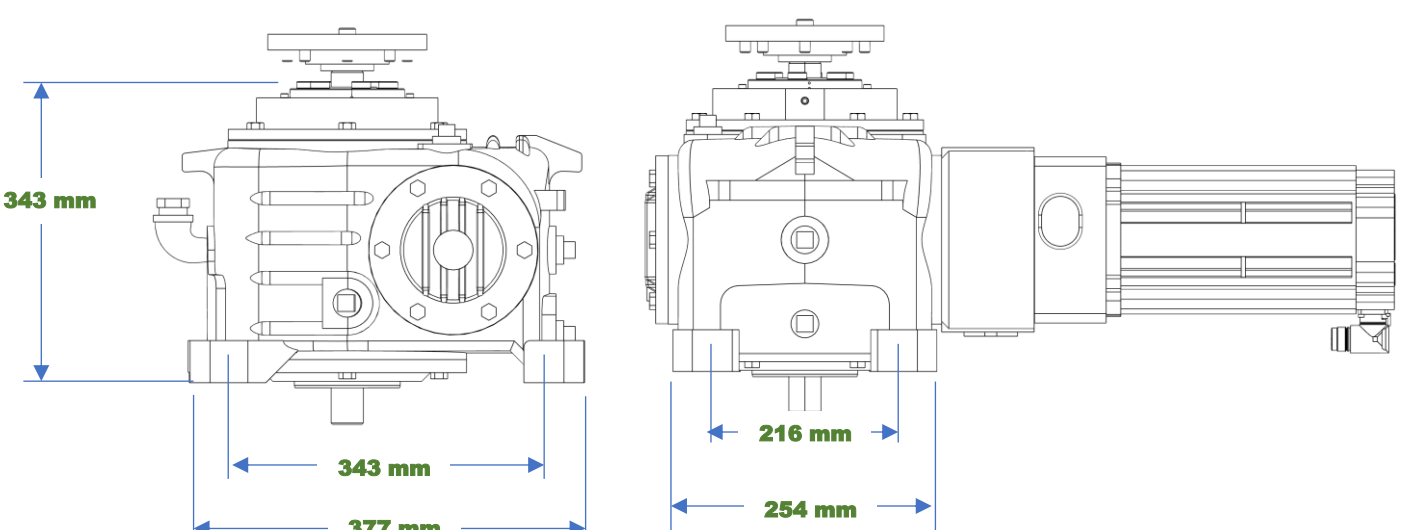
MAX LIFTING CAPACITY 8.5 Tons

Triton Size 5020-050
Ba llScrew Lift

MAX LIFTING CAPACITY 5.0 Tons

	Travel / Turn		Jack Efficiency	
5:1 Gear Ratio	4.000	mm	87.40	%
10:1 Gear Ratio	2.000	mm	81.88	%
20:1 Gear Ratio	1.000	mm	74.52	%
30:1 Gear Ratio	0.667	mm	71.76	%
40:1 Gear Ratio	0.500	mm	64.40	%
50:1 Gear Ratio	0.400	mm	61.64	%





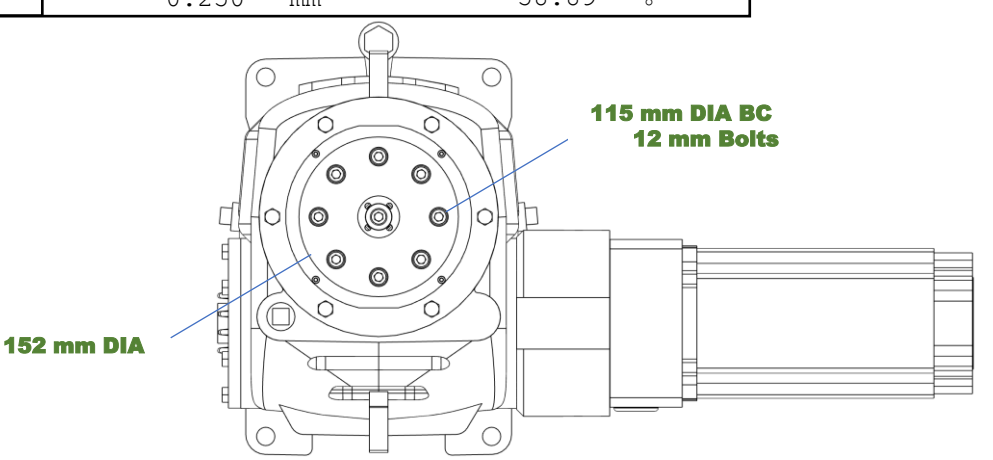
FANGTOOTH NEPTUNE RATINGS

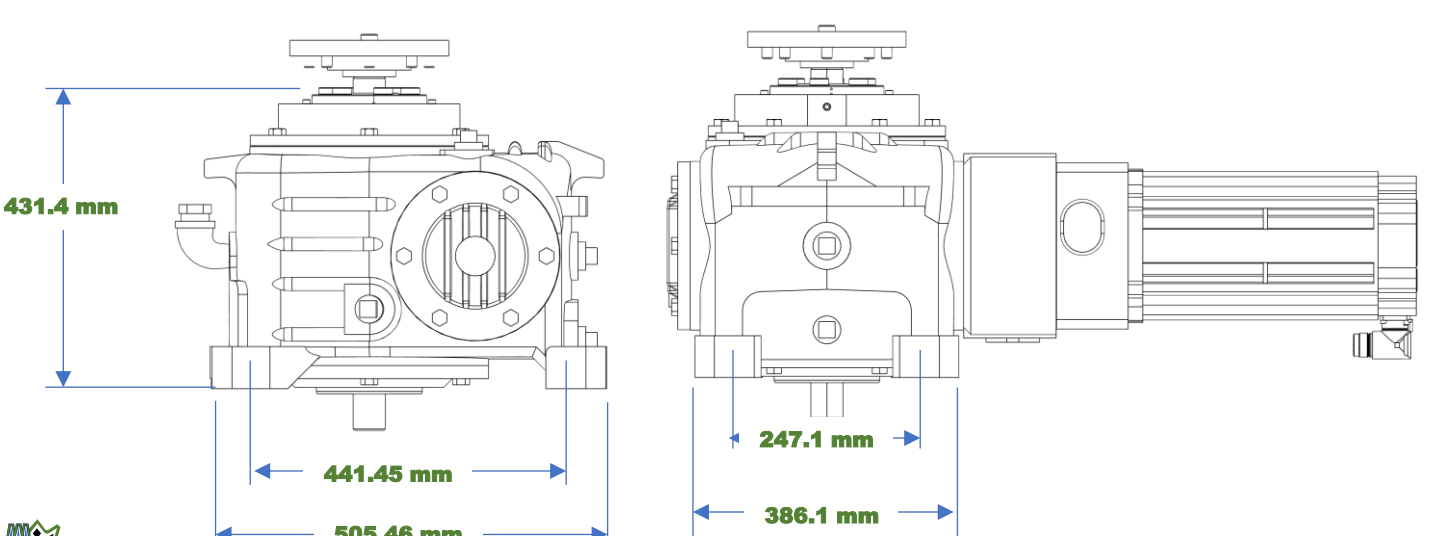
NEPTUNE Planetary Lift

Max Speed is dependent on Mounting Configuration and Length.
Please Call Application Engineering for Advice.

Size 3915-110 MAX LIFTING CAPACITY 11.0 Tons

	Travel / Turn		Jack Efficiency	
5:1 Gear Ratio	3.000	mm	87.40	%
10:1 Gear Ratio	1.500	mm	81.88	%
20:1 Gear Ratio	0.750	mm	74.52	%
30:1 Gear Ratio	0.50	mm	71.76	%
40:1 Gear Ratio	0.375	mm	64.40	%
50:1 Gear Ratio	0.300	mm	61.64	%
60:1 Gear Ratio	0.250	mm	58.89	%





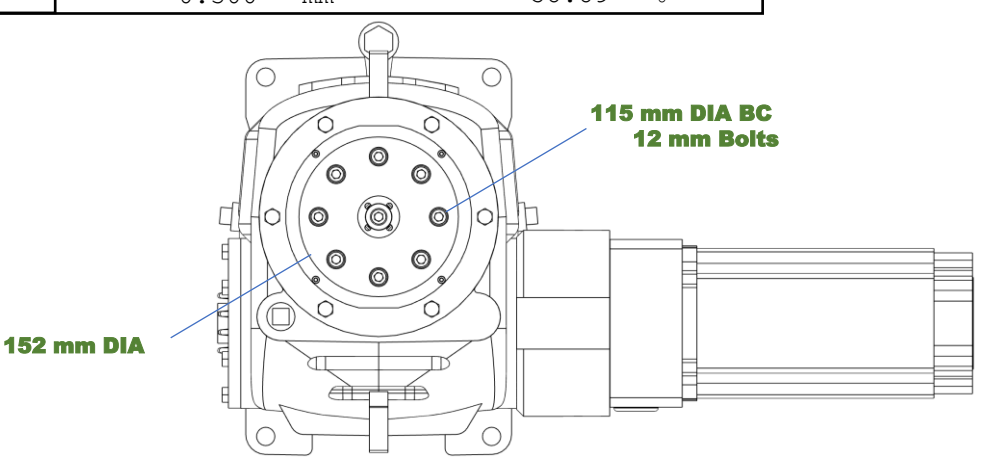
FANGTOOTH NEPTUNE RATINGS

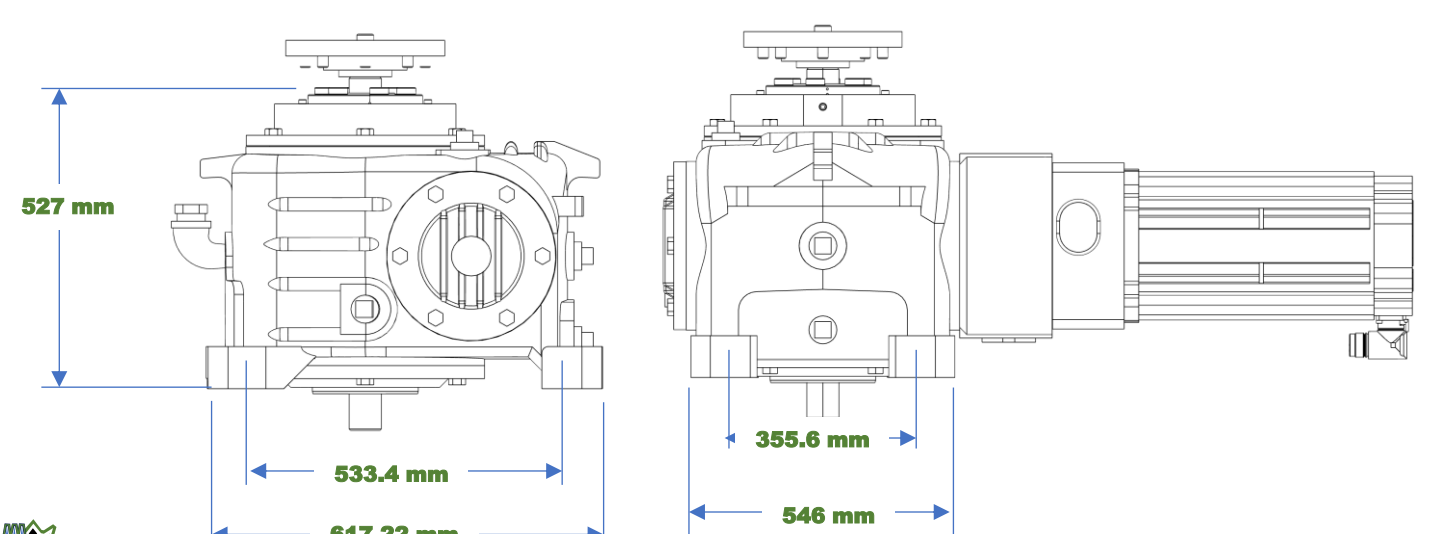
NEPTUNE Planetary Lift

Max Speed is dependent on Mounting Configuration and Length.
Please Call Application Engineering for Advice.

Size 4818-190 MAX LIFTING CAPACITY 19.0 Tons

	Travel / Turn		Jack Efficiency	
5:1 Gear Ratio	3.600	mm	87.40	%
10:1 Gear Ratio	1.800	mm	81.88	%
20:1 Gear Ratio	0.900	mm	74.52	%
30:1 Gear Ratio	0.600	mm	71.76	%
40:1 Gear Ratio	0.450	mm	64.40	%
50:1 Gear Ratio	0.360	mm	61.64	%
60:1 Gear Ratio	0.300	mm	58.89	%





FANGaxis CATALOG CONTENTS

fang OPEN Standard Axis

Page 32

Series	FANGO2504 – 400#		FANGO2508 – 800#	
Pinion Pitch dia.	55.174	mm	98.68	mm
Travel per rev	173.334	mm	310.00	mm
Pinion Inertia	1.79	$kgcm^2$	26.27	$kgcm^2$
Efficiency	92%			
Max Lifting Force	423.769	lbs	802.568	lbs
Max Input Torque*	370.000	Nm	5133.000	inlb
Repeatability	0.070	mm		
Pinion Box Weight	11.000	kg	13.000	kg
Rack Weight	4.400	kg/m	6.000	kg/m
Rail Weight	3.200	kg/m	3.200	kg/m
Base Clamp Weight	3.048	kg	3.048	kg

fang MAX Heavy Axis

Page 54

FANGX2560 – FANGX2562 – FANGW2522 / (Mod 3 Rack)

Pinion Pitch dia.	70.030	mm	2.7570	in
Travel per rev	220.000	mm	8.6614	in
Pinion Inertia	4.64	$kgcm^2$	1.5856	$lbin^2$
Efficiency	92%			
Max Lifting Force	11120.000	N	2500.0000	lbs
Max Input Torque*	580.000	Nm	5133.0000	inlb
Repeatability	0.030	mm	0.0012	in
Pinion Box Weight	14.000	kg	30.865	lb
Rack Weight	6.000	kg/m	4.032	lb/ft
Rail Weight	3.200	kg/m	2.150	lb/ft
Base Clamp Weight	3.048	kg	6.720	lb

MADE IN USA
LIVONIA MI

fang

OPEN

Standard Axis

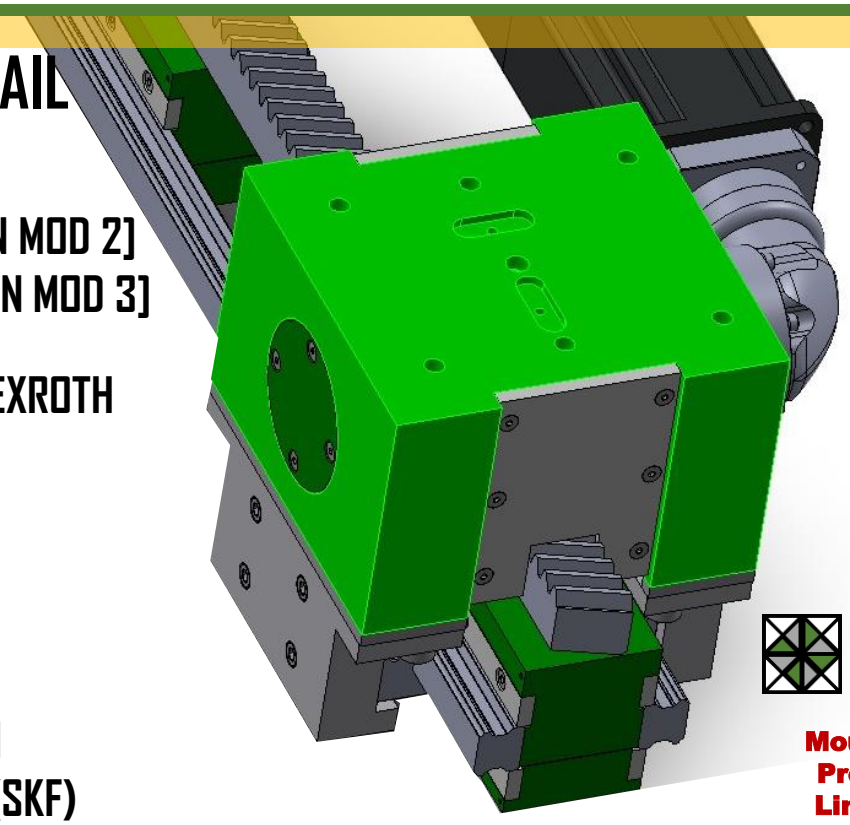
400# SERIES FANG02504
800# SERIES FANG02508

SIZE 25 PROFILED RAIL HELICAL RACK

400# - [55.17mm DIA PINION MOD 2]
800# - [96.68mm DIA PINION MOD 3]

Your Rail Preference

- BOSCH REXROTH
- THK
- HIWIN
- IKO
- INA
- NSK
- THOMSON
- EWELLIX (SKF)



FANGTOOTH
Carbide Alloy Tooth Grip Hardness 2nd To Diamond
Mounts & Aligns Profiled Rail for Linear Bearings

GUIDED RACK DRIVEN AXIS TRANSFERS, LIFTS & GANTRIES

LONGER STRONGER & FASTER
- than Belt Drives & Ball Screws
- ideal for welding applications

M ultiple Heads on 1 Axis
E xtremely Long Lengths
S afe Vertical Hold
H igh Precision, Force & Speed

"CAN" + Cantilevered Loads

www.fang2th.com

fang TOOTH

FANGaxis FANGopen

Fangtooth Inc builds heavy duty guided gear rack actuators and cartesian pick N place systems based on a unique linear profiled rail mounting technique using a fangtooth clamp.
Fangtooth Specializes in high precision moves which are LONGER STRONGER & FASTER - than Belt Drives & Ball Screws - ideal for welding applications as there are no plastic parts – large Aerospace envelopes – Lifts & Elevators – Warehousing – 7th Axis Robot Moves – Long Axis with multiple independent heads, etc.

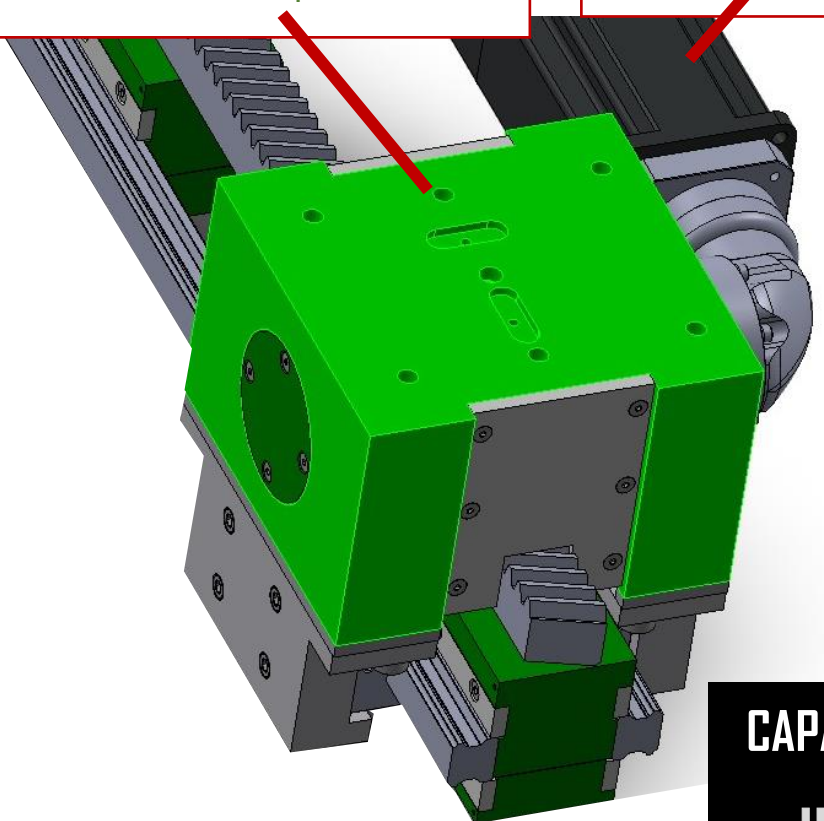
Series	FANGO2504 – 400#		FANGO2508 – 800#	
Pinion Pitch dia.	55.174	mm	98.68	mm
Travel per rev	173.334	mm	310.00	mm
Pinion Inertia	1.79	$kgcm^2$	26.27	$kgcm^2$
Efficiency	92%			
Max Lifting Force	423.769	lbs	802.568	lbs
Max Input Torque*	370.000	Nm	5133.000	inlb
Repeatability	0.070	mm		
Pinion Box Weight	11.000	kg	13.000	kg
Rack Weight	4.400	kg/m	6.000	kg/m
Rail Weight	3.200	kg/m	3.200	kg/m
Base Clamp Weight	3.048	kg	3.048	kg

FANG02504
FANG02508

Figure 1.0

[000] Pre-Engineered Pinion Drive with a sealed pinion built for low backlash, precision and lubrication ports.

[050] Ready Mounted Planetary Servo Gearboxes that will mount the motor of your choice.



CAPABILITIES

Up to 5 m/s

Up to 70 microns repeatability (Std. 100 microns)

Single Axis Up to 800 lbs lift forces

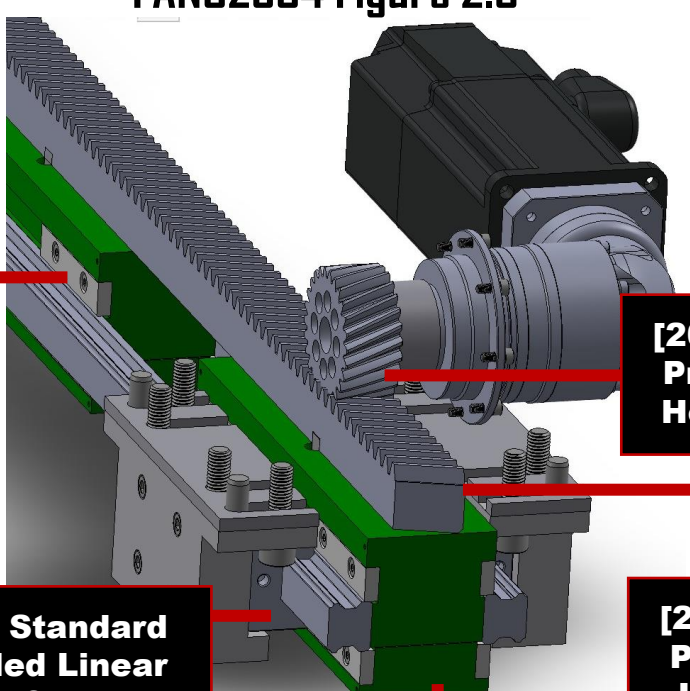
WHAT IS A FANGTOOTH

The base of the FANGaxis is a common mounting block called a FANGclamp [100] that uses a Fangtooth™ [105] which has a coating (hardness 2nd to diamond) to clamp and align the reference edge of the linear rail [075]. This also mounts a standard precision DIN helical gear rack [205] to create an actuated linear guide system

INFINITE CONFIGURATIONS

- Fangtooth™ FANGaxis can be specified with many input configurations.
- Single or Dual Rails & Single or Dual Racks.
- Additional Runner Blocks (Guide Cars) can be added easily on each axis
- Synchronize Axis Electrically or Mechanically for Gantries, Elevators, Lifts, etc.

FANG2504 Figure 2.0



[105] Carbide Alloy Tooth Grip Hardness 2nd to Diamond!

[200] Standard Precision DIN Helical Pinion

[205] Standard Precision DIN Helical Rack

[075] Standard Profiled Linear Guide & Linear Bearings

[100] Common Mounting Block FANGclamp

fang OPEN Standard Axis

MAX 800#

INSPIRE . GREAT . AUTOMATION

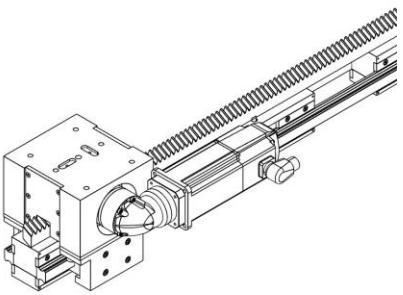
www.fang2th.com - 11970 Mayfield - Livonia, MI 48150

FANGopen STANDARD AXIS SPECS / CONFIGURATIONS

Series	FANGO2504 – 400#		FANGO2508 – 800#	
Pinion Pitch dia.	55.174	mm	98.68	mm
Travel per rev	173.334	mm	310.00	mm
Pinion Inertia	1.79	$kgcm^2$	26.27	$kgcm^2$
Efficiency	92%			
Max Lifting Force	423.769	lbs	802.568	lbs
Max Input Torque*	370.000	Nm	5133.000	inlb
Repeatability	0.070	mm		
Pinion Box Weight	11.000	kg	13.000	kg
Rack Weight	4.400	kg/m	6.000	kg/m
Rail Weight	3.200	kg/m	3.200	kg/m
Base Clamp Weight	3.048	kg	3.048	kg

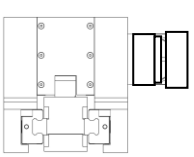
MAX 800#

FANGopen
FANGO-2504 – 400#
FANGO-2508 – 800#
(Size 25 Rail / Clamp 60mm Wide)



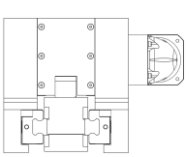
INPUT OPTIONS

P1 – 06PL (400#)
P1 – 09PL (800#)



Robot Mount Planetary Connection
Inline Gearbox

P1 – 06PR (400#)
P1 – 09PR (800#)



Robot Mount Planetary Connection
Right Angle Gearbox

HOW TO ORDER FANGopen STANDARD AXIS
FANG02504 and FANG02508

OPEN

Overall Length

FANGopen: FANG02504P1BB-06PL010-1000RXGX/MS2N04

Servo Motor PN

2560: 2500# Max Thrust Force per Pinion

Size 25 Rail

4 = 400 lb load rating

"24" = 2 Rack Flip

Input Style – See Page "06"

P1 – Planetary Gearbox is the onlycurrent option.

Special Servo Worm May Be Possible.

Linear Brand

TB = THK Ball Rail
HB = Hiwin Ball Rail
BB = Bosch Ball Rail
KB = IKO Ball Rail
NB = NSK Ball Rail
EB = Ewellix Ball Rail

Gearbox:

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

09PL – Size 8 Inline Planetary
09PR – Size 8 Right Angle Planetary

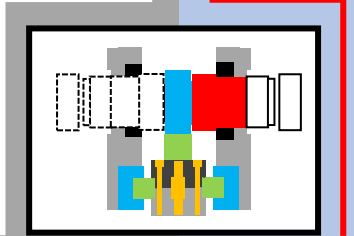
Ratio:

003 – 3:1	025 – 25:1
004 – 4:1	030 – 30:1
005 – 5:1	035 – 35:1
006 – 6:1	040 – 40:1
007 – 7:1	050 – 50:1
008 – 8:1	060 – 60:1
009 – 9:1	070 – 70:1
010 – 10:1	080 – 80:1
012 – 12:1	090 – 90:1
015 – 15:1	100 – 100:1
020 – 20:1	150 – 150:1

Additional Options:

FFG – Fangtooth Finger Guards
BLW – Bellows
TDC – Thin Dense Chrome Protection

R X G X



RAIL POSITIONS

(i) 1st Character
R = Rail on Left
X = No Rail on Left

(ii) 2nd Character
R = Rail on Right
X = No Rail on Right

INPUT POSITIONS

(i) 3rd Character
G = Gearbox on Left
X = Nothing no Left

(ii) 4th Character
G = Gearbox on Right
X = Nothing no Right

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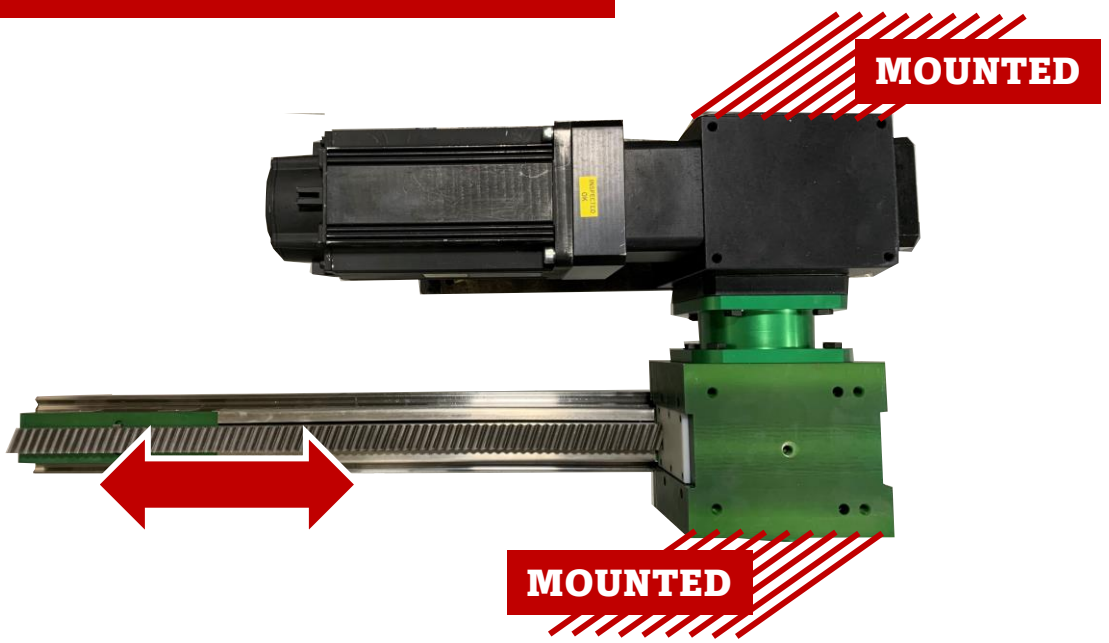
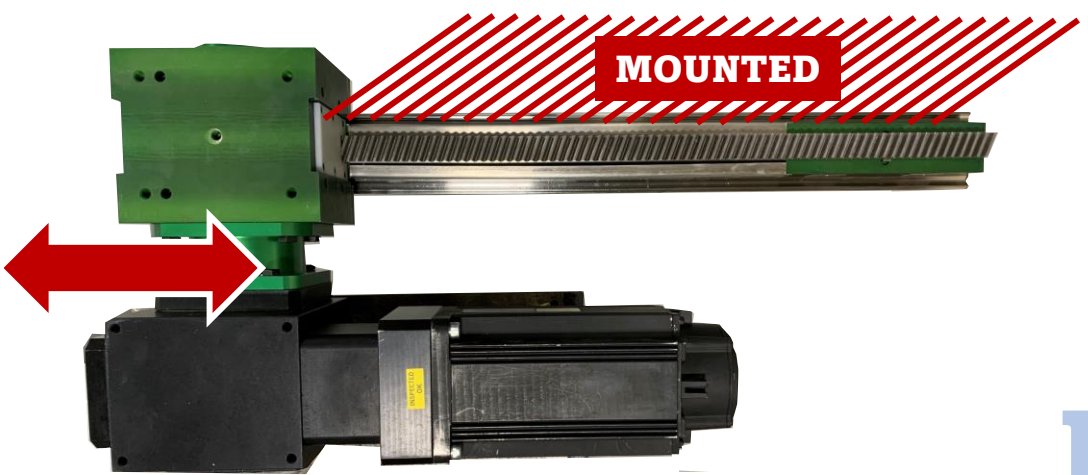
FANGTOOTH FANGAXIS APPLICATION EXAMPLES

FIXED PINION – GUIDE CARS
RACK – RAIL SHUTTLES



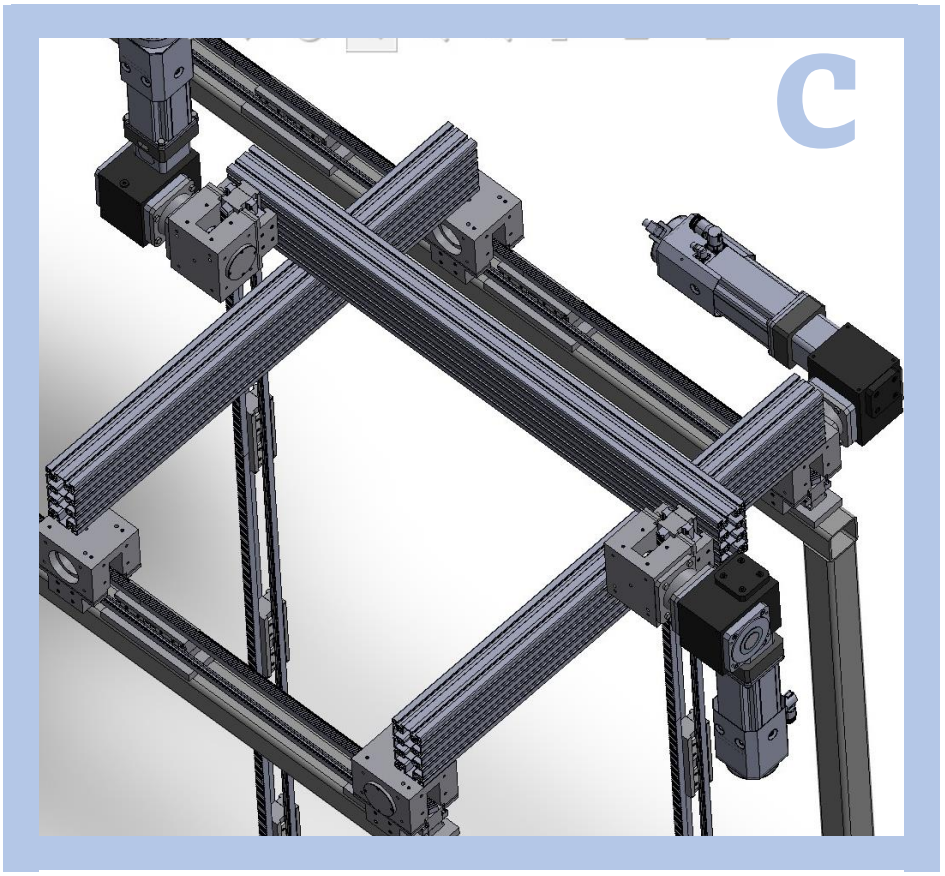
A

FIXED RACK – RAIL
PINION – GEARBOX SHUTTLES



B

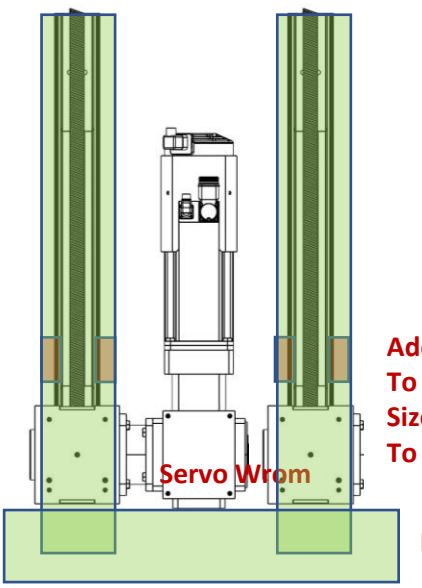
FANGTOOTH FANGAXIS APPLICATION EXAMPLES



INFINITE GANTRY COMBINATIONS

FANGTOOTH FANGAXIS APPLICATION EXAMPLES

CANTILEVERED LIFTS

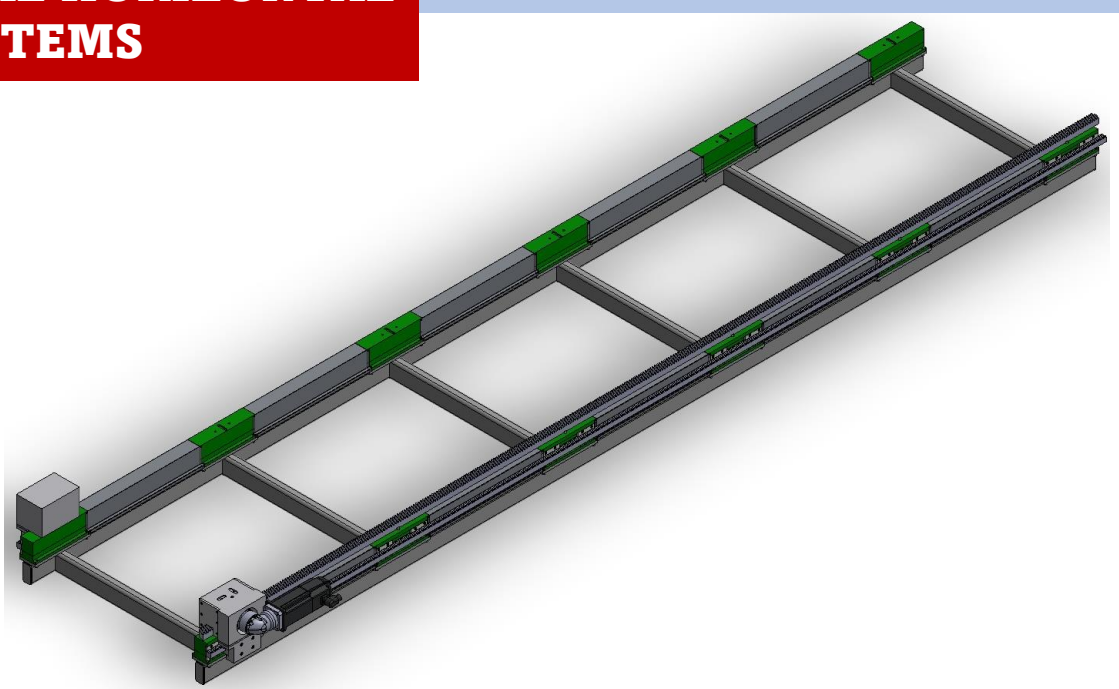


Additional Runner Block
To create 4 rail 8 bearing
Size 25 per-mounted system
To support cantilevered load

Pre-Engineered Post Supports

D

DUAL HORIZONTAL SYSTEMS



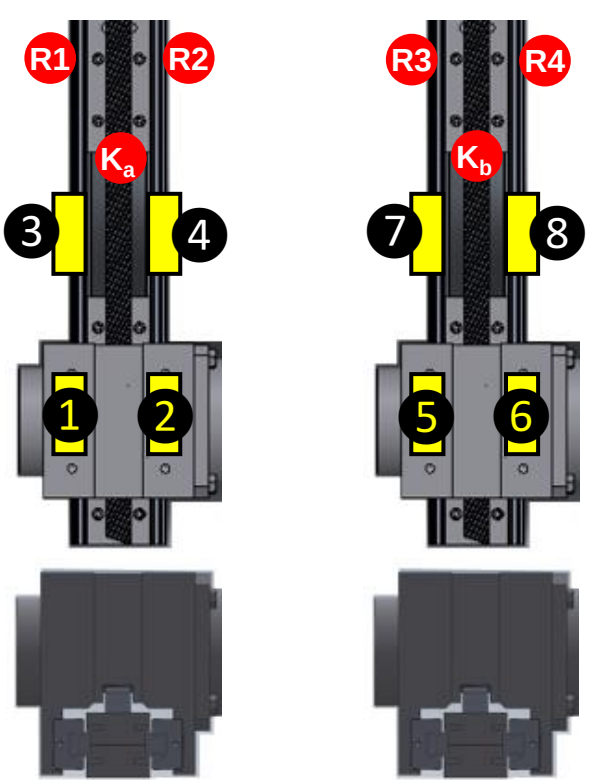
E

FANGaxis SYSTEM SET UPS CHART

Fangtooth Inc FANGaxis offers flexibility in the system set up that optimizes the system performance while allowing you to control costs.

Each Axis can be set up with one or two rails which should be dictated by your loading requirements. In many cases a single axis with two rails can handle significant offset loads. A double wide configuration with 4 rails can handle even more.

Additionally, you can add as many runner blocks per rail to add a great deal of load capacity especially in vertical application with cantilevered loads.



Configuration	# Guide Rails	# Guide Cars	# Racks
a. 1X1-01RX -uses:	1 (R1)	1 (1)	1 (K_a)
b. 1X2-01RX -uses:	1 (R1)	2 (1 3)	1 (K_a)
c. 2X2-01RR -uses:	2 (R1 R2)	2 (1 2)	1 (K_a)
d. 2X4-01RR -uses:	2 (R1 R2)	4 (1 2 3 4)	1 (K_a)
e. 2X2-02RR -uses:	2 (R1 R4)	2 (1 6)	2 (K_a K_b)
f. 2X4-02RR -uses:	2 (R1 R4)	4 (1 6 3 8)	1 (K_a K_b)
g. 4X4-02RR -uses:	4 (R1 R3 R2 R4)	4 (1 2 5 6)	2 (K_a K_b)
h. 4X8-02RR -uses:	4 (R1 R3 R2 R4)	8 (1 2 3 4 6 5 7 8)	2 (K_a K_b)

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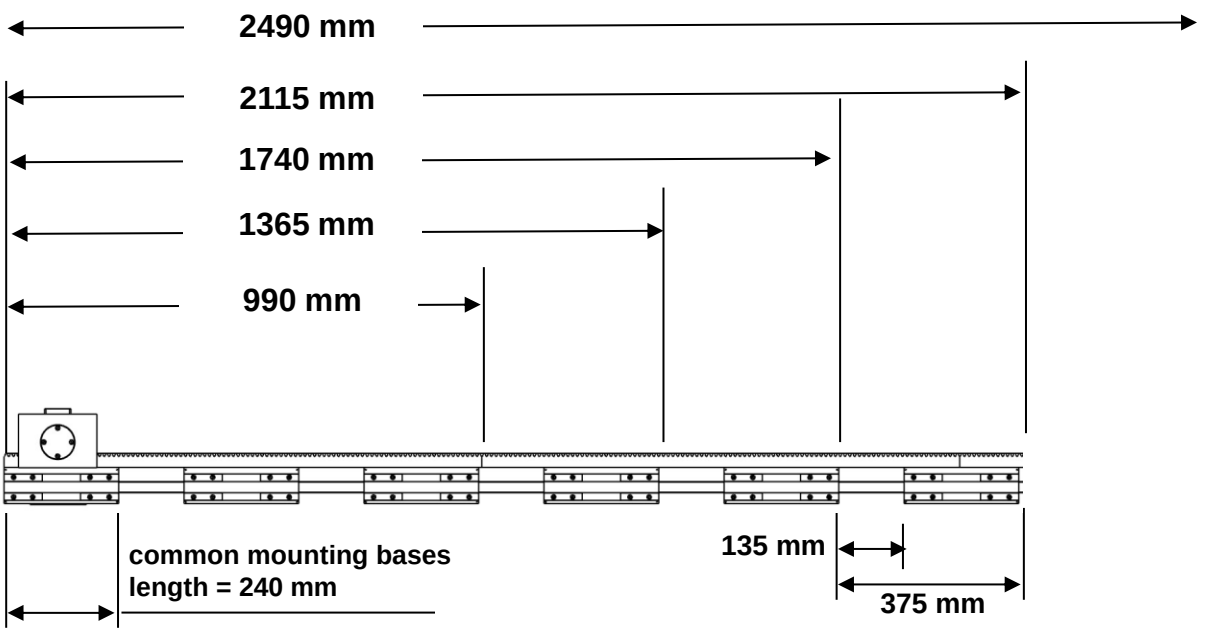
FANGTOOTH RACK KIT LENGTH DIAGRAMS

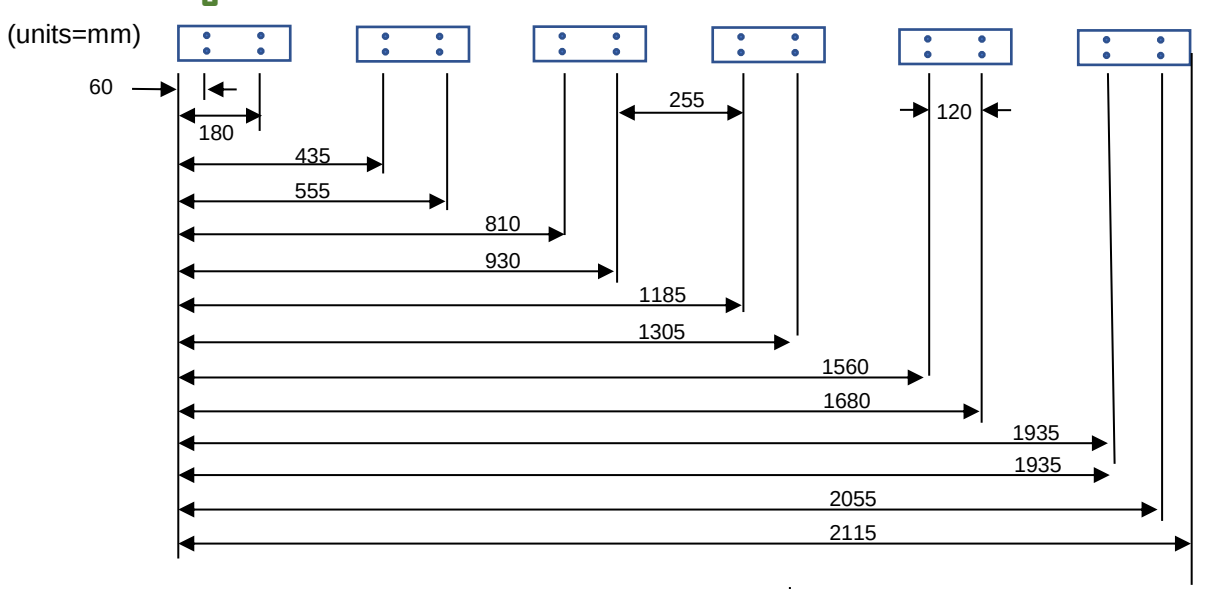
(a) For Lengths at 750mm or below – Two Mounting Bases
(b) For Lengths at 1000mm or below – Three Mounting Bases
(c) For Lengths Above 1000mm – One Mounting Base for Every 375mm
(d) Minimum Standard Length 480 mm

STANDARD LENGTHS: Custom Lengths, Shorter and Longer Lengths are available. The Fangtooth System is Designed for Infinite Length.

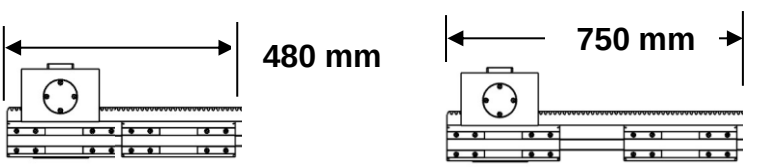
Standard Uses 375 mm Length Increments Spacing Between Bases is 135 mm



Base Mounting Holes M8



2 x Clamp Bases



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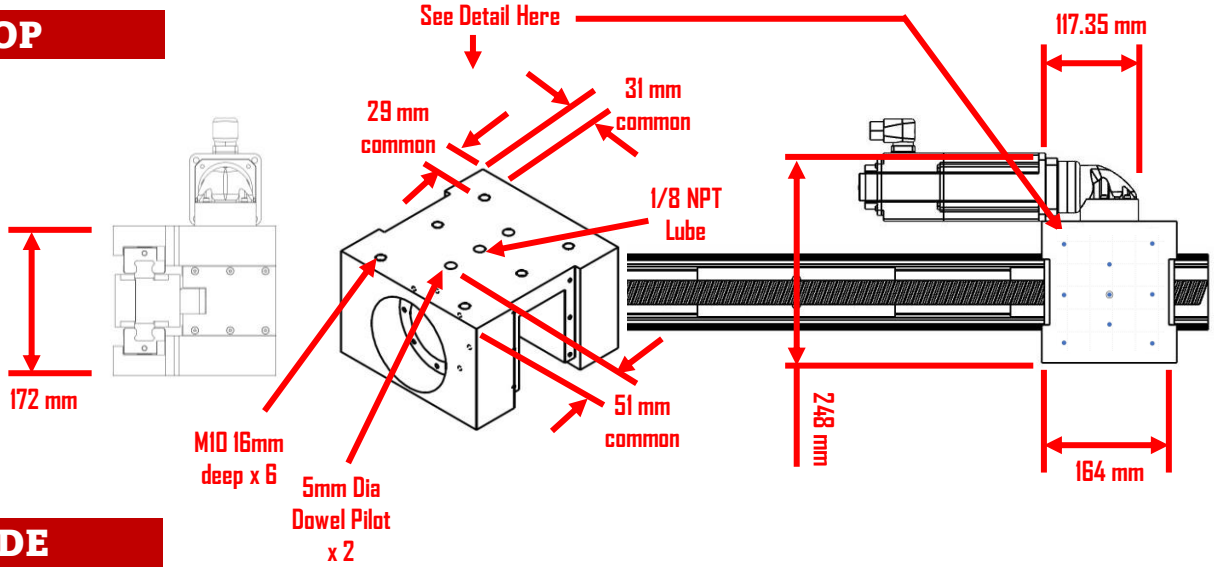
FANGTOOTH FANGopen DIMENSIONS

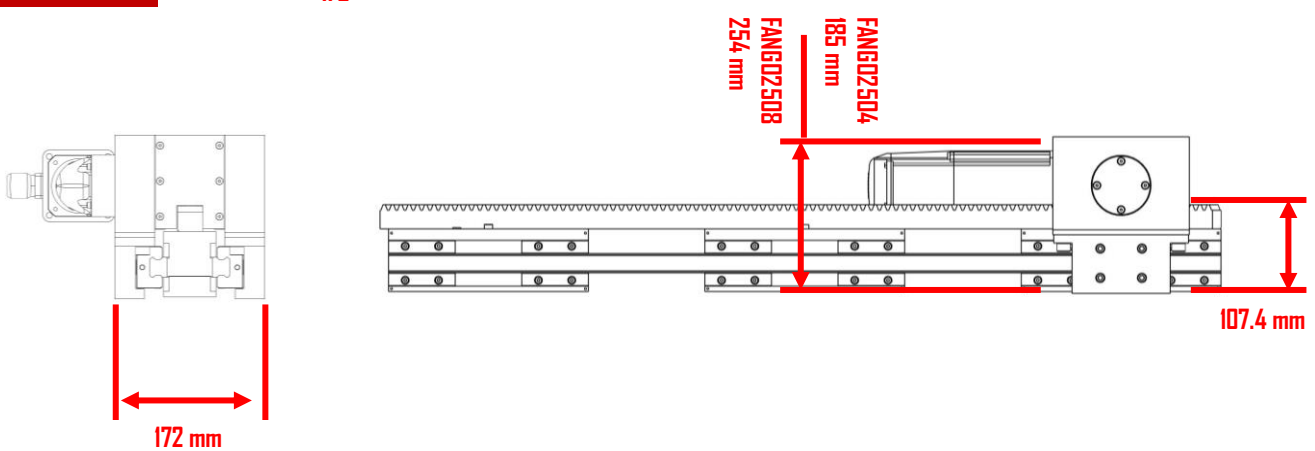
motor not included
motor mount is included

model shown: FANGO2504-P1HB-06PR010-1000RRGX/MOTOR

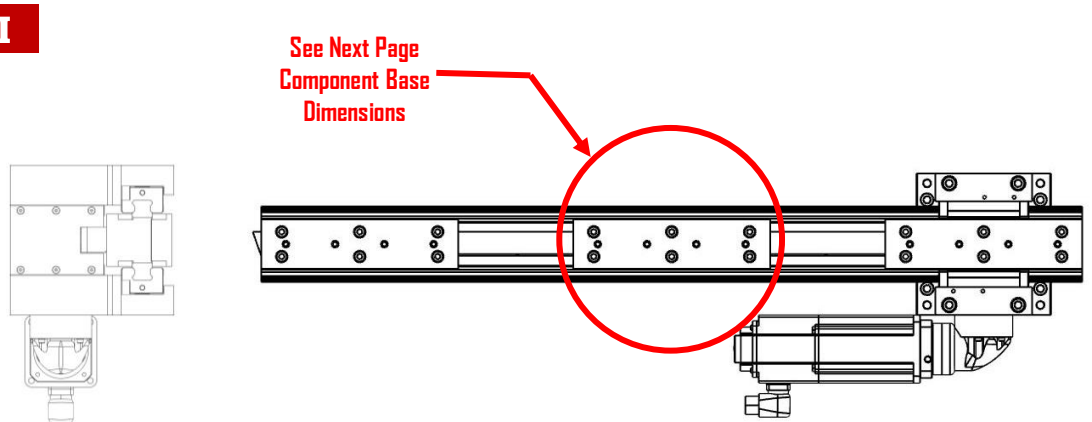
TOP



SIDE



BOTTOM



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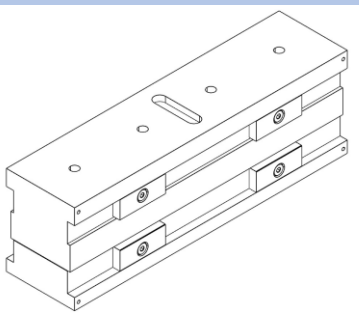
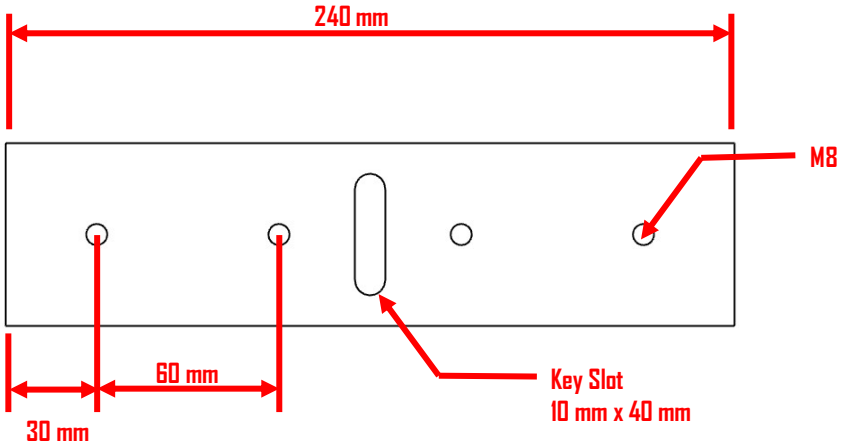
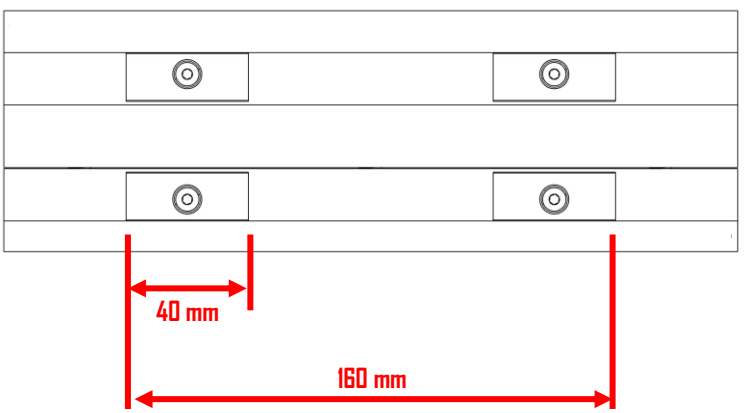
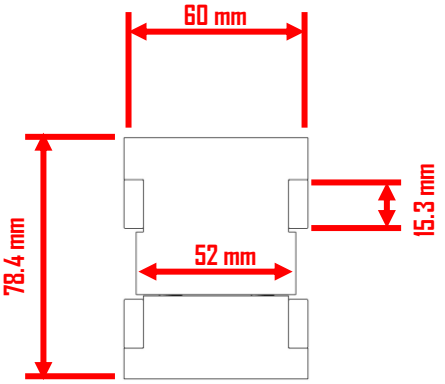
FANGTOOTH STANDARD "FCB" CLAMP BASE DIMENSIONS

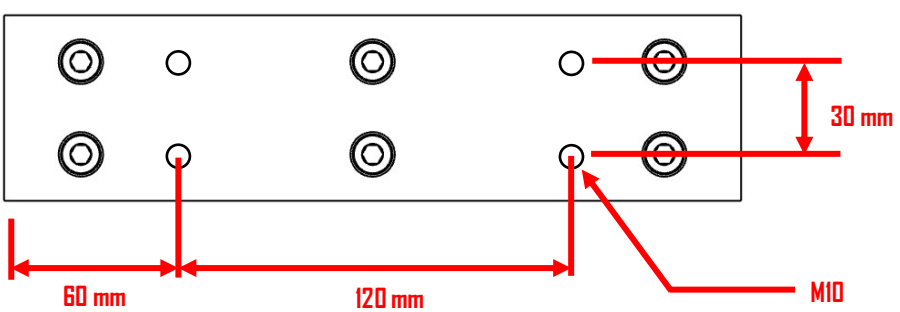
Standard model shown: FCB60OPEN











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)

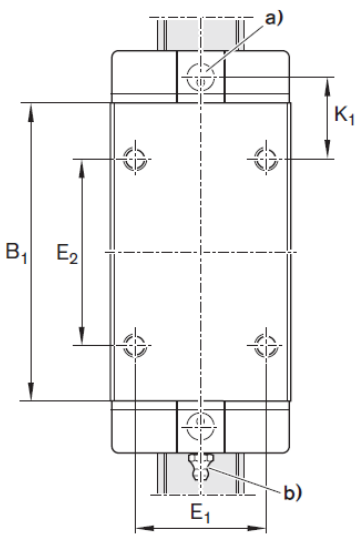
GEARBOX TECHNICAL DATA

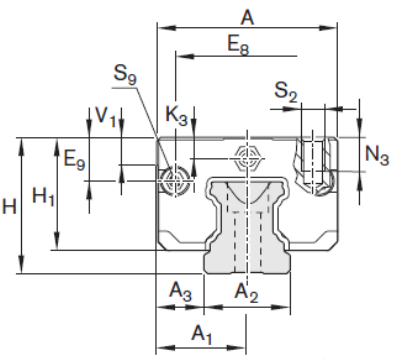
Type		Inline / Right		Inline / Right	
Series	RATIO	06PL	06PR	09PL	09PR
Efficiency %	4:1	97	95	97	95
	5:1	97	95	97	95
	7:1	97	95	97	95
	10:1	97	95	97	95
	14.1	NA	95	NA	95
	16:1	97	NA	97	NA
	20:1	97	95	97	95
	21:1	94	92	94	NA
	25:1	94	NA	94	92
	31:1	94	92	94	NA
	35:1	94	92	94	92
	40:1	94	92	94	92
	50:1	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

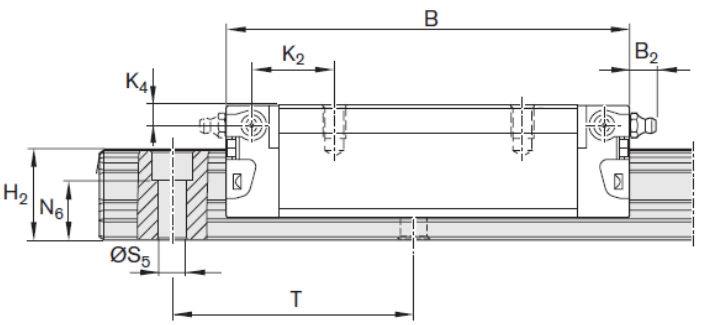
FANGTOOTH GEARBOX TECHNICAL DATA

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			

RUNNER BLOCK SPECIFICATIONS
SIZE 25







Brand	Model	Dimensions							Ratings	
		A	A_2	B	H	H_2	E_1	E_2	C_d(N)	C_0(N)
Bosch Rexroth	1623-214-20	48	23	107.9	36	24.45	35	50	37300	52500
THK	SHS25LV	48	23	109.0	36	20.00	35	50	29208	64700
Hiwin	LGH25HA	48	23	104.6	*40	20.00	35	50	24986	50800
IKO	MMSGG25	48	23	118.0	36	22.00	35	50	24446	38300
INA	KUSE25BHL	48	23	104.3	*40	21.70	35	50	35300	93700
NSK	LY25BN	48	23	107.0	*40	22.00	35	50	27383	71000
Thomson	500D25	48	23	103.5	36	22.70	35	50	25500	60300
Ewellix (SKF)	LLRHS25U	48	23	107.9	36	22.00	35	50	24400	44600

FANGTOOTH REFERENCE MOTION PROFILES TO USED WITH FANGopen STANDARD AXIS SELECTION TABLES

500 mm MOVES

SECTION 00 [500mm of Travel – 16.68 inches]

Profile #	Total Time	Accel Time	Decel Time	Speed	Acceleration	Size 2504 Max Motor Speed	Size 2508 Max Motor Speed	Gearbox Ratio
00.01	2.20 sec	0.10 sec	0.10 sec	0.25 m/s	2.5 m/s2	885.38 rpm	681.80 rpm	10:1
00.02	1.20 sec	0.20 sec	0.20 sec	0.50 m/s	2.5 m/s2	1730.76 rpm	1363.60 rpm	10:1
00.03	0.60 sec	0.10 sec	0.10 sec	1.00 m/s	10 m/s2	3461.52 rpm	2727.20 rpm	10:1
00.03	0.60 sec	0.10 sec	0.10 sec	1.00 m/s	10 m/s2	NA	1363.46 rpm	5:1
00.04	0.40 sec	0.12 sec	0.12 sec	1.78 m/s	15 m/s2	3072.10 rpm	2420.40 rpm	5:1

1000 mm MOVES

SECTION 01 [1000mm of Travel – 39.37 inches]

Profile #	Total Time	Accel Time	Decel Time	Speed	Acceleration	Size 2504 Max Motor Speed	Size 2508 Max Motor Speed	Gearbox Ratio
01.01	4.20 sec	0.10 sec	0.10 sec	0.25 m/s	2.5 m/s2	885.38 rpm	681.80 rpm	10:1
01.02	2.20 sec	0.10 sec	0.10 sec	0.50 m/s	5.0 m/s2	1730.76 rpm	1363.60 rpm	10:1
01.03	1.20 sec	0.20 sec	0.20 sec	1.00 m/s	5.0 m/s2	3461.52 rpm	2727.20 rpm	10:1
01.04	0.60 sec	0.10 sec	0.10 sec	2.00 m/s	20.0 m/s2	3072.10 rpm	2727.20 rpm	5:1
01.05	0.43 sec	0.10 sec	0.10 sec	3.00 m/s	30.0 m/s2	5192.26 rpm	4090.80 rpm	5:1

2500 mm MOVES

SECTION 03 [2500mm of Travel – 98.43 inches]

Profile #	Total Time	Accel Time	Decel Time	Speed	Acceleration	Size 2504 Max Motor Speed	Size 2508 Max Motor Speed	Gearbox Ratio
03.01	10.25 sec	0.250 sec	0.250 sec	0.25 m/s	1.0 m/s2	885.38 rpm	681.80 rpm	10:1
03.02	5.25 sec	0.250 sec	0.250 sec	0.50 m/s	2.0 m/s2	1730.76 rpm	1363.60 rpm	10:1
03.03	2.50 sec	0.250 sec	0.250 sec	1.00 m/s	4.0 m/s2	3461.52 rpm	2727.20 rpm	10:1
03.04	1.25 sec	0.125 sec	0.125 sec	2.00 m/s	16.0 m/s2	3461.52 rpm	2727.20 rpm	5:1
03.05	0.87 sec	0.100 sec	0.100 sec	3.00 m/s	30.0 m/s2	5192.26 rpm	4090.80 rpm	5:1

FANGopen Linear Axis Weight	500mm (2 bases) 1 RAIL	500mm (2 bases) 2 RAILS	1000mm (3 bases) 1 RAIL	1000mm (3 bases) 2 RAILS	2500mm (7 bases) 1 RAIL	2500mm (7 bases) 2 RAILS
kg	7.00	8.60	17.20	20.40	75.00	83.00
lbs	15.43	19.00	38.00	45.00	165.35	183.00

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.

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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 "14"
Total Weight Includes Fangtooth Moving Parts Weight

MAXIMUM INPUT TORQUE REQUIREMENTS

FANGopen STANDARD AXIS HORIZONTAL MOVES

SECTION 00 [500mm of Travel – 16.68 inches] HORIZONTAL ← 500 mm →

USING FANG0-2504 06PL 10:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
2.20 sec	0.25 m/s	00.01	0.33 Nm	0.64 Nm	1.27 Nm	2.53 Nm	3.37 Nm	5.05 Nm
1.20 sec	0.50 m/s	00.02	0.33 Nm	0.64 Nm	1.27 Nm	2.53 Nm	3.37 Nm	5.05 Nm
0.60 sec	1.00 m/s	00.03	1.17 Nm	2.27 Nm	4.48 Nm	-	-	-

USING FANG0-2504 06PL 5:1 Gear Ratio [Gearbox Inertia 0.14 kgcm²] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.40 sec	1.78 m/s	00.04	3.33 Nm	6.59 Nm	13.13 Nm	-	-	-

USING FANG0-2508 09PL 25:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.60 sec	1.00 m/s	00.03	-	-	-	6.56 Nm	8.71 Nm	-

SECTION 01 [1000mm of Travel – 39.37 inches] HORIZONTAL ← 1000 mm →

USING FANG0-2504 06PL 10:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
4.20 sec	0.25 m/s	01.01	0.35 Nm	0.69 Nm	1.37 Nm	2.73 Nm	3.63 Nm	5.44 Nm
2.20 sec	0.50 m/s	01.02	0.61 Nm	1.18 Nm	2.34 Nm	4.65 Nm	6.19 Nm	-
1.20 sec	1.00 m/s	01.03	0.61 Nm	1.18 Nm	2.34 Nm	4.65 Nm	6.19 Nm	-

USING FANG0-2504 06PL 5:1 Gear Ratio [Gearbox Inertia 0.14 kgcm²] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.60 sec	2.00 m/s	01.04	4.38 Nm	8.70 Nm	-	-	-	-

USING FANG0-2508 09PL 25:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	300 lbs	600 lbs	800 lbs	1200 lbs	1800 lbs	2400 lbs
2.20 sec	0.50 m/s	01.02	-	-	-	6.81 Nm	-	-

USING FANG0-2508 09PL 7:1 Gear Ratio [Gearbox Inertia 0.47 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.60 sec	2.00 m/s	01.04	-	-	15.77 Nm	-	-	-
0.40 sec	3.00 m/s	01.05	8.67 Nm	16.89 Nm	-	-	-	-

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 "14"
Total Weight Includes Fangtooth Moving Parts Weight

MAXIMUM INPUT TORQUE REQUIREMENTS

FANGopen STANDARD AXIS HORIZONTAL MOVES

SECTION 03 [2500mm of Travel – 98.34 inches] HORIZONTAL ← 2500 mm →

USING FANG0-2504 06PL 10:1 Gear Ratio [Gearbox Inertia 0.13 kgcm^2] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
10.25 sec	0.25 m/s	03.01	0.16 Nm	0.32 Nm	0.63 Nm	1.26 Nm	1.68 Nm	2.51 Nm
5.25 sec	0.50 m/s	03.02	0.27 Nm	0.53 Nm	1.06 Nm	2.11 Nm	2.80 Nm	4.20 Nm
2.50 sec	1.00 m/s	03.03	0.49 Nm	0.97 Nm	1.91 Nm	3.80 Nm	5.06 Nm	-

USING FANG0-2504 06PL 5:1 Gear Ratio [Gearbox Inertia 0.14 kgcm^2] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
1.25 sec	2.00 m/s	03.04	3.53 Nm	7.0 Nm	13.94 Nm	-	-	-

USING FANG0-2508 09PL 10:1 Gear Ratio [Gearbox Inertia 0.44 kgcm^2] P.D. 98.96 mm

Total Time	Speed	Profile #	300 lbs	600 lbs	800 lbs	1200 lbs	1800 lbs	2400 lbs
2.50 sec	1.00 m/s	03.03	-	-	-	13.61 Nm	-	-

USING FANG0-2508 09PL 4:1 Gear Ratio [Gearbox Inertia 0.51 kgcm^2] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.87 sec	3.00 m/s	03.05	16.10 Nm	31.60 Nm	-	-	-	-

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 "14"
Total Weight Includes Fangtooth Moving Parts Weight

MAXIMUM INPUT TORQUE REQUIREMENTS

FANGopen STANDARD AXIS VERTICAL MOVES

SECTION 00 [500mm of Travel – 16.68 inches] VERTICAL

USING FANG0-2504 06PL 10:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
2.20 sec	0.25 m/s	00.01	1.31 Nm	2.60 Nm	5.19 Nm	-	-	-
1.20 sec	0.50 m/s	00.02	1.31 Nm	2.60 Nm	5.19 Nm	-	-	-
0.60 sec	1.00 m/s	00.03	2.14 Nm	4.22 Nm	-	-	-	-

USING FANG0-2504 06PL 5:1 Gear Ratio [Gearbox Inertia 0.14 kgcm²] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.40 sec	1.78 m/s	00.04	5.29 Nm	10.51 Nm	-	-	-	-

USING FANG0-2508 09PL 50:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
2.20 sec	0.25 m/s	00.01	-	-	-	3.83 Nm	-	-
1.20 sec	0.50 m/s	00.02	-	-	-	3.83 Nm	-	-

USING FANG0-2508 09PL 21:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.60 sec	1.00 m/s	00.03	-	-	7.35 Nm	-	-	-

SECTION 01 [1000mm of Travel – 39.37 inches] VERTICAL

USING FANG0-2504 06PL 10:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
4.20 sec	0.25 m/s	01.01	1.31 Nm	2.60 Nm	5.19 Nm	-	-	-
2.20 sec	0.50 m/s	01.02	1.58 Nm	3.14 Nm	-	-	-	-
1.20 sec	1.00 m/s	01.03	1.58 Nm	3.14 Nm	-	-	-	-

USING FANG0-2504 06PL 5:1 Gear Ratio [Gearbox Inertia 0.14 kgcm²] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.60 sec	2.00 m/s	01.04	6.35 Nm	12.62 Nm	-	-	-	-

USING FANG0-2508 09PL 50:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
4.20 sec	0.25 m/s	01.01	-	-	1.93 Nm	3.83 Nm	-	-
2.20 sec	0.50 m/s	01.02	-	-	2.35 Nm	-	-	-

USING FANG0-2508 09PL 25:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
2.20 sec	0.50 m/s	01.02	-	-	-	9.17 Nm	-	-
1.20 sec	1.00 m/s	01.03	-	-	-	9.17 Nm	-	-

USING FANG0-2508 09PR 10:1 Gear Ratio [Gearbox Inertia 2.25 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.60 sec	2.00 m/s	01.04	-	-	23.52 Nm	-	-	-

USING FANG0-2508 09PR 10:1 Gear Ratio [Gearbox Inertia 2.25 kgcm²] P.D. 98.96 mm

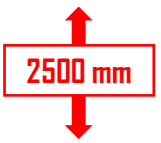
Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.40 sec	3.00 m/s	01.05	15.85 Nm	31.18 Nm	-	-	-	-

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 "14"
Total Weight Includes Fangtooth Moving Parts Weight

MAXIMUM INPUT TORQUE REQUIREMENTS

FANGopen STANDARD AXIS VERTICAL MOVES



SECTION 03 [2500mm of Travel – 98.43 inches] VERTICAL

USING FANG0-2504 06PL 10:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
10.25 sec	0.25 m/s	03.01	1.14 Nm	2.28 Nm	5.19 Nm	-	-	-
5.25sec	0.50 m/s	03.02	1.25 Nm	2.49 Nm	4.98 Nm	-	-	-
2.50 sec	1.00 m/s	03.03	1.86 Nm	3.71 Nm	-	-	-	-

USING FANG0-2504 06PL 5:1 Gear Ratio [Gearbox Inertia 0.14 kgcm²] P.D. 55.174 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
1.25 sec	2.00 m/s	03.04	5.49 Nm	10.92 Nm	-	-	-	-

USING FANG0-2508 09PL 50:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
10.25 sec	0.25 m/s	03.01	-	-	-	3.28 Nm	4.36 Nm	-
5.25 sec	0.50 m/s	03.02	-	-	-	3.67 Nm	4.88 Nm	-

USING FANG0-2508 09PL 50:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
2.50 sec	1.00 m/s	03.03	-	-	5.10 Nm	-	-	-

USING FANG0-2508 09PL 21:1 Gear Ratio [Gearbox Inertia 0.13 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
2.50 sec	1.00 m/s	03.03	-	-	-	10.17 Nm	-	-

USING FANG0-2508 09PL 5:1 Gear Ratio [Gearbox Inertia 0.47 kgcm²] P.D. 98.96 mm

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.87 sec	3.00 m/s	03.05	15.52 Nm	-	-		-	-

USING FANG0-2508 09PL 7:1 Gear Ratio [Gearbox Inertia 0.47 kgcm²] P.D. 98.96 mm

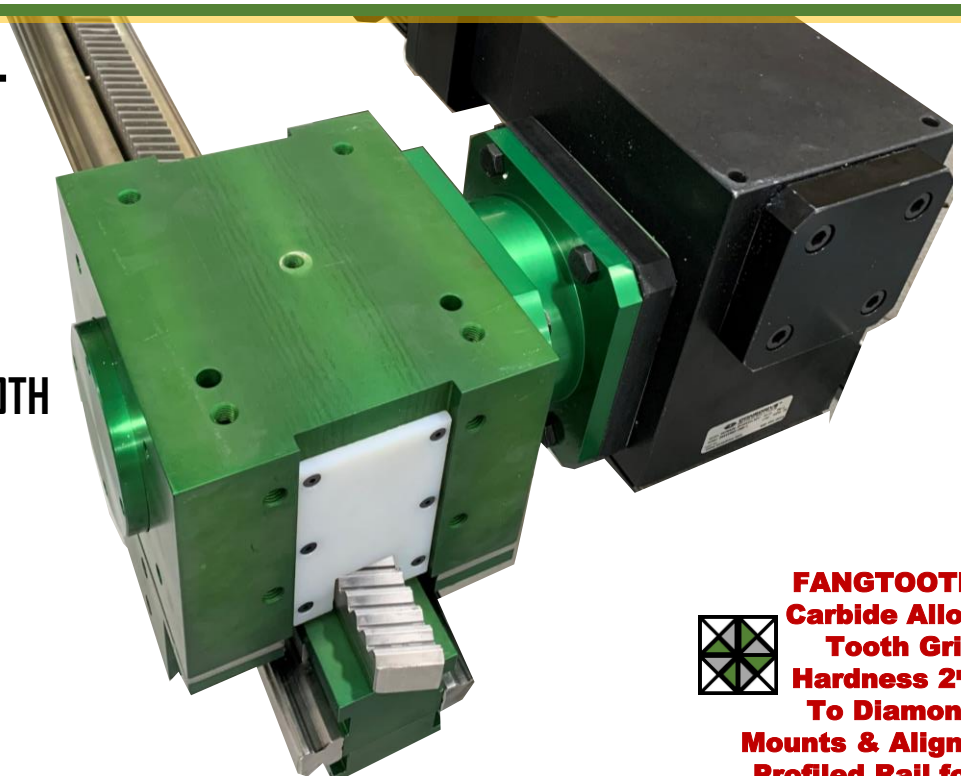
Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	800 lbs	1200 lbs
0.87 sec	3.00 m/s	03.05	-	21.90 Nm	-	-	-	-

MADE IN USA
LIVONIA MI

fang MAX
Heavy Axis

2500# SERIES FANGX2560

SIZE 25 PROFILED RAIL
MOD 3 HELICAL RACK
70.03mm DIA PINION



Your Rail Preference

- BOSCH REXROTH
- THK
- HIWIN
- IKO
- INA
- NSK
- THOMSON
- EWELLIX (SKF)

FANGTOOTH
Carbide Alloy Tooth Grip Hardness 2nd To Diamond
Mounts & Aligns Profiled Rail for Linear Bearings

GUIDED RACK DRIVEN AXIS TRANSFERS, LIFTS & GANTRIES

LONGER STRONGER & FASTER
- than Belt Drives & Ball Screws
- ideal for welding applications

M ultiple Heads on 1 Axis
E xtremely Long Lengths
S afe Vertical Hold
H igh Precision, Force & Speed

www.fang2th.com

fang TOOTH

FANGaxis FANGmax

Fangtooth Inc builds heavy duty guided gear rack actuators and cartesian pick N place systems based on a unique linear profiled rail mounting technique using a fangtooth clamp.
Fangtooth Specializes in high precision moves which are LONGER STRONGER & FASTER - than Belt Drives & Ball Screws - ideal for welding applications as there are no plastic parts – large Aerospace envelopes – Lifts & Elevators – Warehousing – 7th Axis Robot Moves – Long Axis with multiple independent heads, etc.

FANGX2560 – FANGX2562 – FANGW2522 / (Mod 3 Rack)

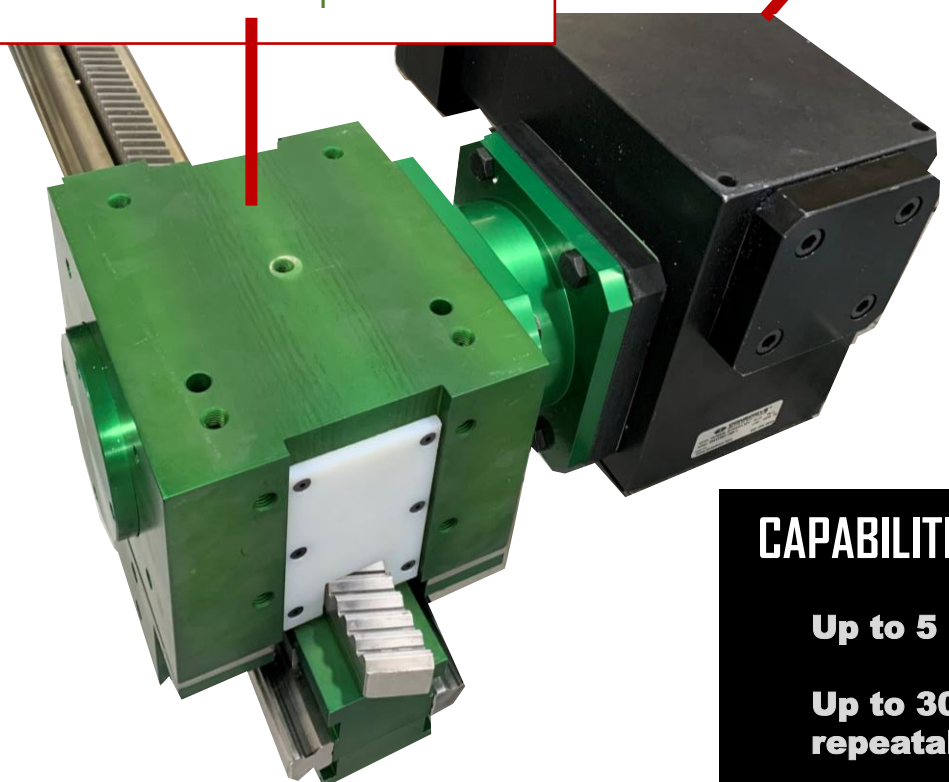
Pinion Pitch dia.	70.030	mm	2.7570	in
Travel per rev	220.000	mm	8.6614	in
Pinion Inertia	4.64	$kgcm^2$	1.5856	$lbin^2$
Efficiency	92%			
Max Lifting Force	11120.000	N	2500.0000	lbs
Max Input Torque*	580.000	Nm	5133.0000	inlb
Repeatability	0.030	mm	0.0012	in
Pinion Box Weight	14.000	kg	30.865	lb
Rack Weight	6.000	kg/m	4.032	lb/ft
Rail Weight	3.200	kg/m	2.150	lb/ft
Base Clamp Weight	3.048	kg	6.720	lb

FANGTOOTH FANGmax FEATURES

FANGX-2560 Figure 1.0

[000] Pre-Engineered Pinion Drive with a sealed pinion built for low backlash, precision and lubrication ports.

[050] Ready Servo Gearboxes that will mount the motor of your choice.



CAPABILITIES

- **Up to 5 m/s**
- **Up to 30 microns repeatability**
- **Single Axis Up to 2500 lbs lift forces**
- **Dual Axis Up to 5000 lbs lift forces**
- **Quad Axis Up to 10000 lbs lift forces**

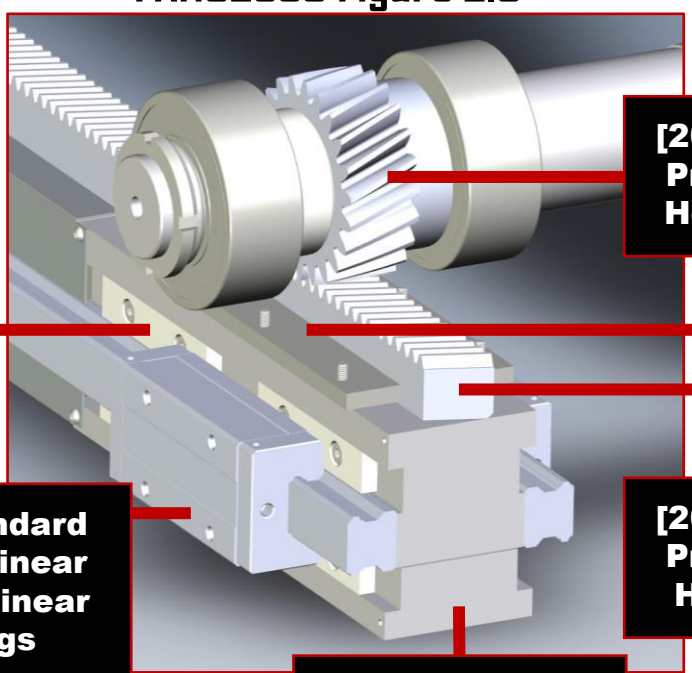
WHAT IS A FANGTOOTH

The base of the FANGaxis is a common mounting block called a FANGclamp [100] that uses a Fangtooth™ [105] which has a coating [hardness 2nd to diamond) to clamp and align the reference edge of the linear rail [075]. This also mounts a standard precision DIN helical gear rack [205] to create an actuated linear guide system

INFINITE CONFIGURATIONS

- Fangtooth™ FANGaxis can be specified with many input configurations.
- Single or Dual Rails & Single or Dual Racks.
- Additional Runner Blocks (Guide Cars) can be added easily on each axis
- Synchronize Axis Electrically or Mechanically for Gantries, Elevators, Lifts, etc.

FANG2560 Figure 2.0



fang TOOTH

[105] Carbide Alloy Tooth Grip Hardness 2nd to Diamond!

[200] Standard Precision DIN Helical Pinion

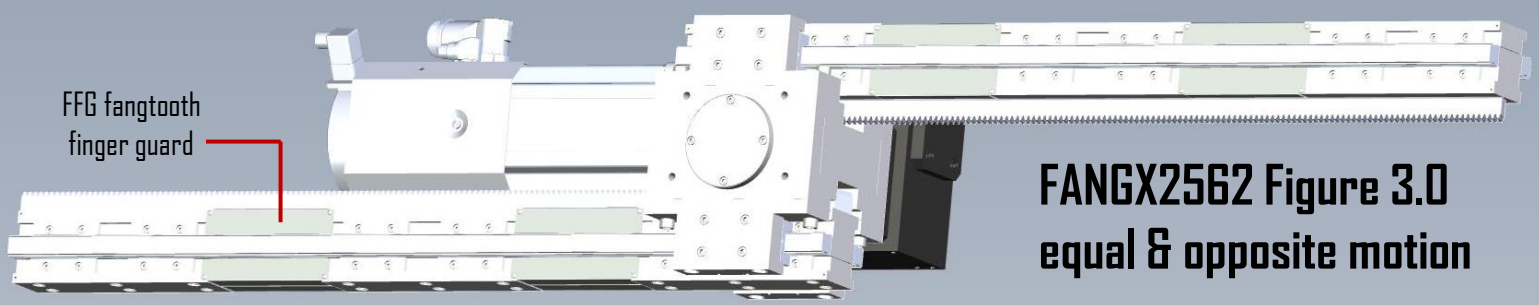
Rack Seal

[205] Standard Precision DIN Helical Rack

[075] Standard Profiled Linear Guide & Linear Bearings

[100] Common Mounting Block FANGclamp

fang **FLIP** Dual Axis



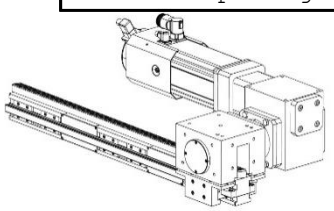
FANGX2562 Figure 3.0
equal & opposite motion

FANGmax HEAVY AXIS SPECS / CONFIGURATIONS

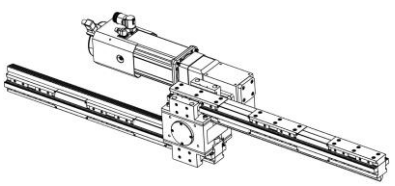
FANGX2560 – FANGX2562 – FANGW2522 / (Mod 3 Rack)

Pinion Pitch dia.	70.030	mm	2.7570	in
Travel per rev	220.000	mm	8.6614	in
Pinion Inertia	4.64	$kgcm^2$	1.5856	$lbin^2$
Efficiency	92%			
Max Lifting Force	11120.000	N	2500.0000	lbs
Max Input Torque*	580.000	Nm	5133.0000	inlb
Repeatability	0.030	mm	0.0012	in
Pinion Box Weight	14.000	kg	30.865	lb
Rack Weight	6.000	kg/m	4.032	lb/ft
Rail Weight	3.200	kg/m	2.150	lb/ft
Base Clamp Weight	3.048	kg	6.720	lb

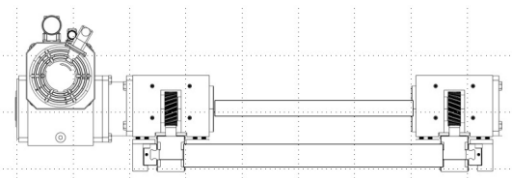
MAX 2500#



FANGmax
FANGX-2560
(Size 25 Rail / Clamp 60mm Wide)



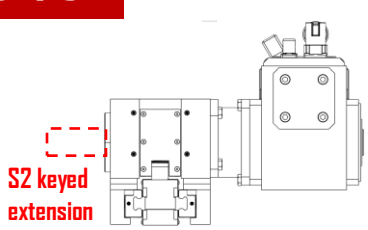
FANGflip
FANGX-2562
(2 Rack Flip)



FANG-XX
FANGW-2522
(2 Rack Double Wide)
(Customized Width)

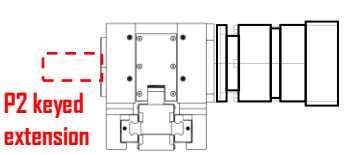
INPUT OPTIONS

S1/S2



Keyed Gearbox Connection

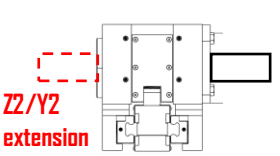
P1/P2



Split Clamp Planetary Connection

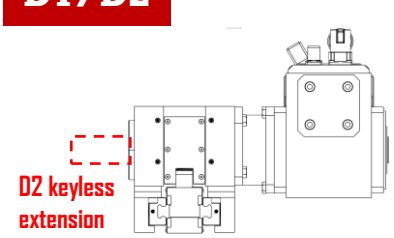
Z1/Z2 Y1/Y2

"Z" keyed
"Y" keyless



Solid Drive Shaft

D1/D2



Shrink Disc Gearbox Connection

fang MAX Heavy Axis

MAX 2500#

INSPIRE . GREAT . AUTOMATION

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HOW TO ORDER FANGmax HEAVY AXIS & FANGflip
FANGX2560 and FANGX2562

MAX

Overall Length

FANGmax: FANGX2560P1BB-51SW010-1000RXGX/MS2N05D

Servo Motor PN

2560: 2500# Max Thrust Force per Pinion

Size 25 Rail

Mounting Base Width 60 mm
"62" = 2 Rack Flip

Input Style – See Page "06"
Z1 / Z2: Keyed Solid Shaft
Y1 / Y2: Keyless Solid Shaft
P1 / P2: Planetary Gearhead
S1 / S2: Servo Worm (Keyed)
D1 / D2: Servo (Shrink Disc)

Linear Brand
TB = THK Ball Rail
HB = Hiwin Ball Rail
BB = Bosch Ball Rail
KB = IKO Ball Rail
NB = NSK Ball Rail
EB = Ewellix Ball Rail

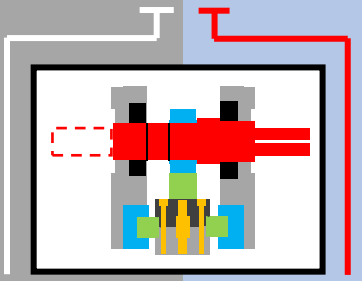
Gearbox:
Blank – No Gearbox
38SW – Size 38 Servo Worm
51SW – Size 51 Servo Worm
64SW – Size 64 Servo Worm
76SW – Size 76 Servo Worm
89SW – Size 89 Servo Worm
T5SW – T-100/5 Servo Worm

Ratio:
003 – 3:1
004 – 4:1
475 – 4.75:1
005 – 5:1
006 – 6:1
675 – 6.75:1
007 – 7:1
008 – 8:1
009 – 9:1
925 – 9.25:1
010 – 10:1
015 – 15:1
020 – 20:1
025 – 25:1
030 – 30:1
040 – 40:1
050 – 50:1
060 – 60:1
070 – 70:1
080 – 80:1
090 – 90:1
100 – 100:1
150 – 150:1

NOTE: Many other gearboxes & gearmotors/brakemotors available upon request.

Additional Options:
FFG – Fangtooth Finger Guards
BLW – Bellows
TDC – Thin Dense Chrome Protection

R X G X



RAIL POSITIONS

(i) 1st Character
R = Rail on Left
X = No Rail on Left

(ii) 2nd Character
R = Rail on Right
X = No Rail on Right

INPUT POSITIONS

(i) 3rd Character
G = Gearbox on Left
X = Nothing no Left
Z/Y = Shaft on Left

(ii) 4th Character
G = Gearbox on Right
X = Nothing no Right
Z/Y = Shaft on Right

fang MAX Heavy Axis

MAX 2500#

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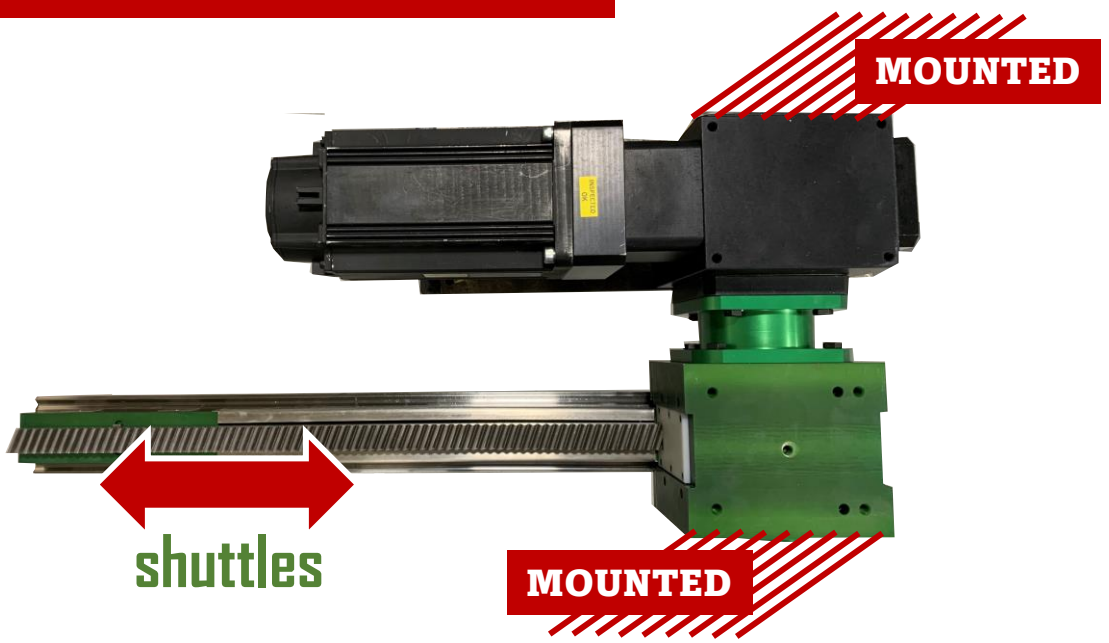
FANGTOOTH FANGaxis APPLICATION EXAMPLES (1/3)

- two methods of movement -

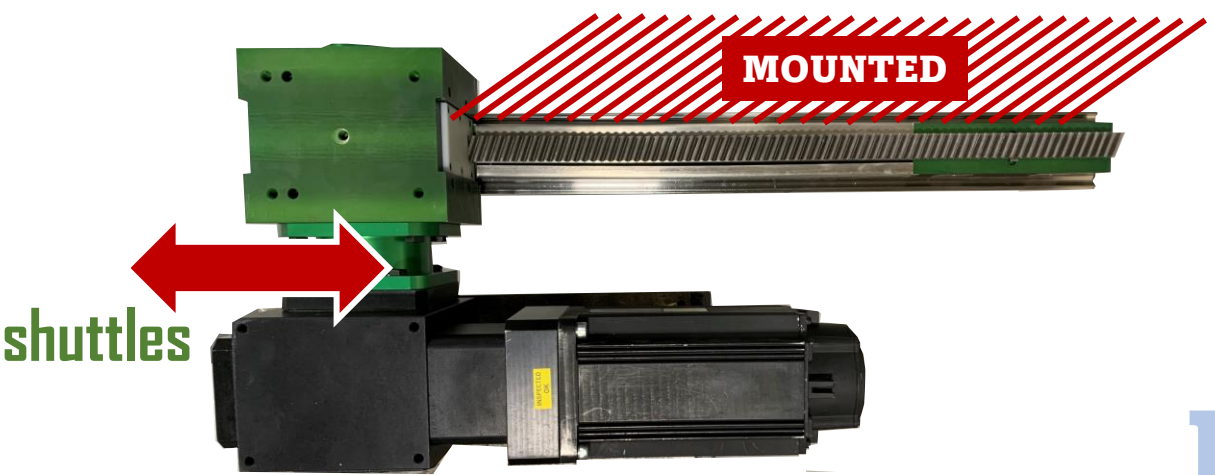
FIXED PINION – GUIDE CARS
RACK – RAIL SHUTTLES



A

FIXED RACK – RAIL
PINION – GEARBOX SHUTTLES

- great for multiple pinions moving independently on a single axis -



B

FANGTOOTH FANGaxis APPLICATION EXAMPLES (2/3)

fang BOT Multi Axis

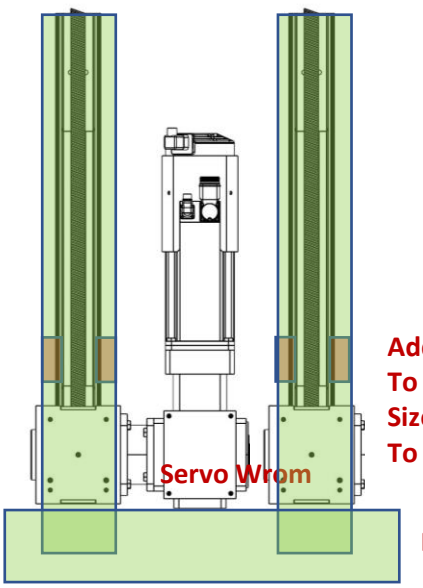
F#BT-XYZ

Configurable Cartesian Systems and Pick & Place
('#' = Number of Axis in System)

INFINITE GANTRY COMBINATIONS

FANGTOOTH FANGaxis APPLICATION EXAMPLES (3/3)

CANTILEVERED LIFTS



fang LIFT Rack Axis

FANGL-25XX *

Vertical Stand, Built for Cantilevered Loads (*10,000 lbs Max with 4 posts)

Additional Runner Block
To create 4 rail 8 bearing
Size 25 per-mounted system
To support cantilevered load

Pre-Engineered Post Supports

MAX 10000#

D

DUAL HORIZONTAL SYSTEMS

fang XX Double Wide

FANGW-2522

Two Parallel Rails and Racks
Infinite Width 5000 lb Max

MAX 5000#

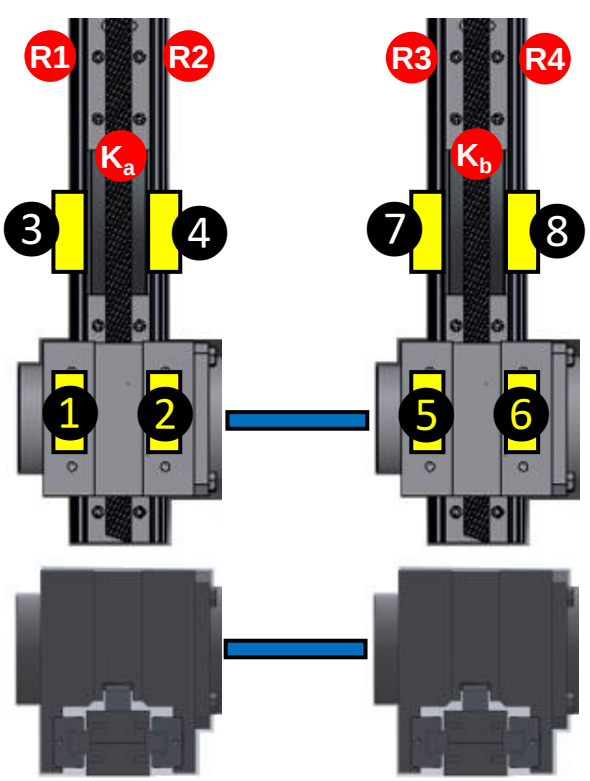
E

FANGaxis SYSTEM SET UPS CHART

Fangtooth Inc FANGaxis offers flexibility in the system set up that optimizes the system performance while allowing you to control costs.

Each Axis can be set up with one or two rails which should be dictated by your loading requirements. In many cases a single axis with two rails can handle significant offset loads. A double wide configuration with 4 rails can handle even more.

Additionally, you can add as many runner blocks per rail to add a great deal of load capacity especially in vertical application with cantilevered loads.



Configuration	# Guide Rails	# Guide Cars	# Racks
a. 1X1-01RX -uses:	1 (R1)	1 (1)	1 (Ka)
b. 1X2-01RX -uses:	1 (R1)	2 (1 3)	1 (Ka)
c. 2X2-01RR -uses:	2 (R1 R2)	2 (1 2)	1 (Ka)
d. 2X4-01RR -uses:	2 (R1 R2)	4 (1 2 3 4)	1 (Ka)
e. 2X2-02RR -uses:	2 (R1 R4)	2 (1 6)	2 (Ka Kb)
f. 2X4-02RR -uses:	2 (R1 R4)	4 (1 6 3 8)	1 (Ka Kb)
g. 4X4-02RR -uses:	4 (R1 R3 R2 R4)	4 (1 2 5 6)	2 (Ka Kb)
h. 4X8-02RR -uses:	4 (R1 R3 R2 R4)	8 (1 2 3 4 6 5 7 8)	2 (Ka Kb)

fang MAX Heavy Axis

MAX 2500#

INSPIRE . GREAT . AUTOMATION

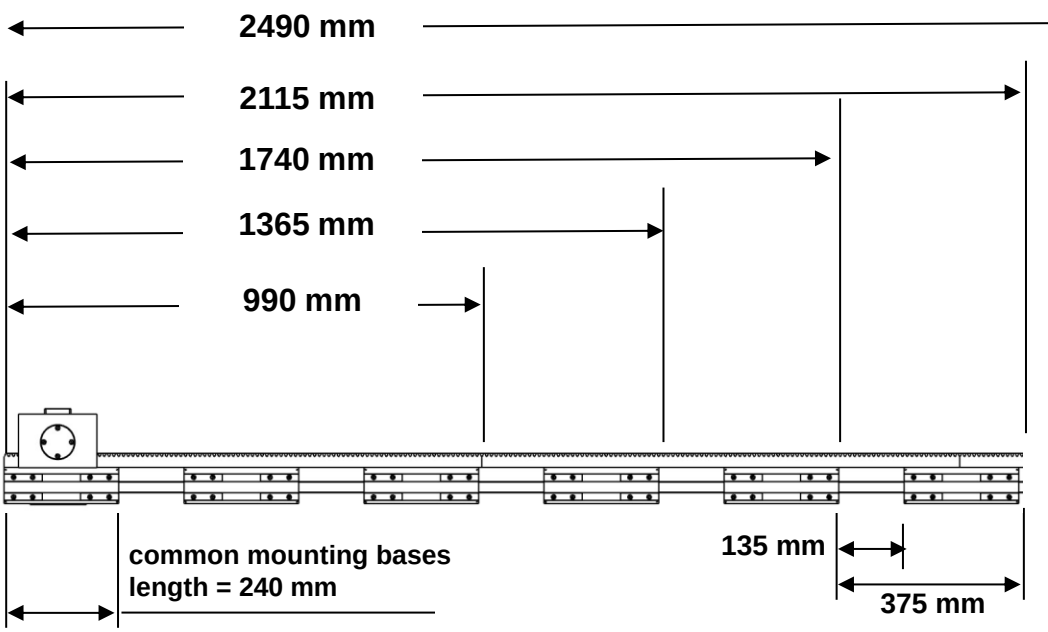
www.fang2th.com - 11970 Mayfield - Livonia, MI 48150

FANGTOOTH RACK KIT LENGTH DIAGRAMS

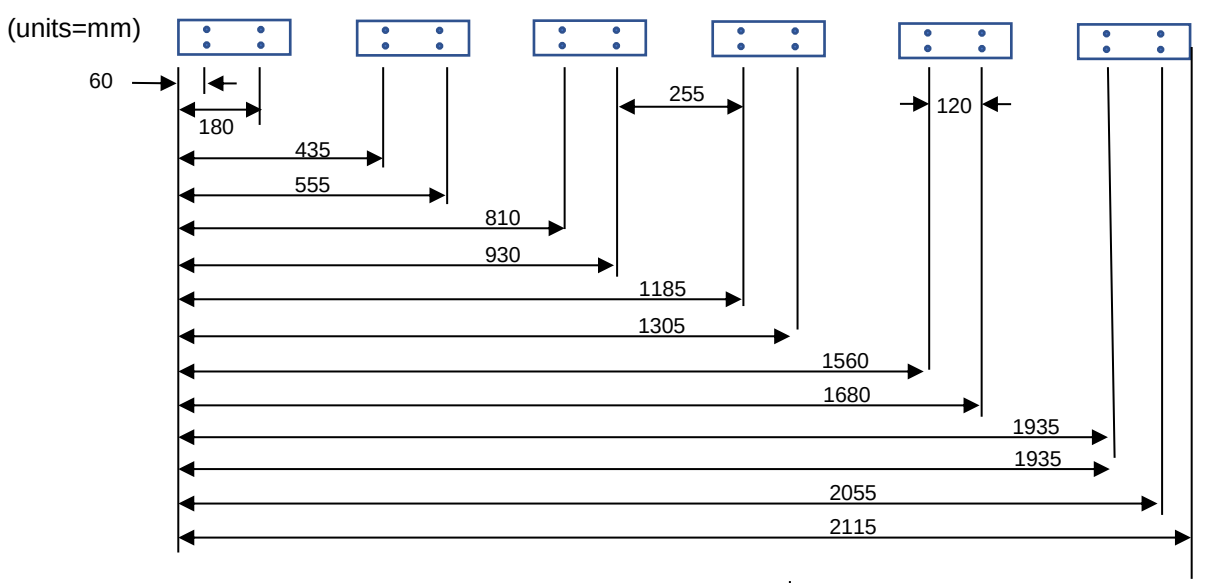
(a) For Lengths at 750mm or below – Two Mounting Bases
(b) For Lengths at 1000mm or below – Three Mounting Bases
(c) For Lengths Above 1000mm – One Mounting Base for Every 375mm
(d) Minimum Standard Length 480 mm

STANDARD LENGTHS: Custom Lengths, Shorter and Longer Lengths are available. The Fangtooth System is Designed for Infinite Length.

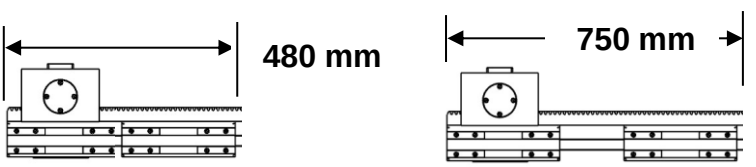
Standard Uses 375 mm Length Increments Spacing Between Bases is 135 mm



Base Mounting Holes M8



2 x Clamp Bases



MAX 2500#

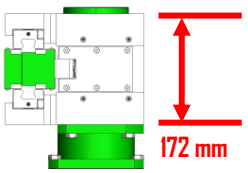
fang MAX Heavy Axis

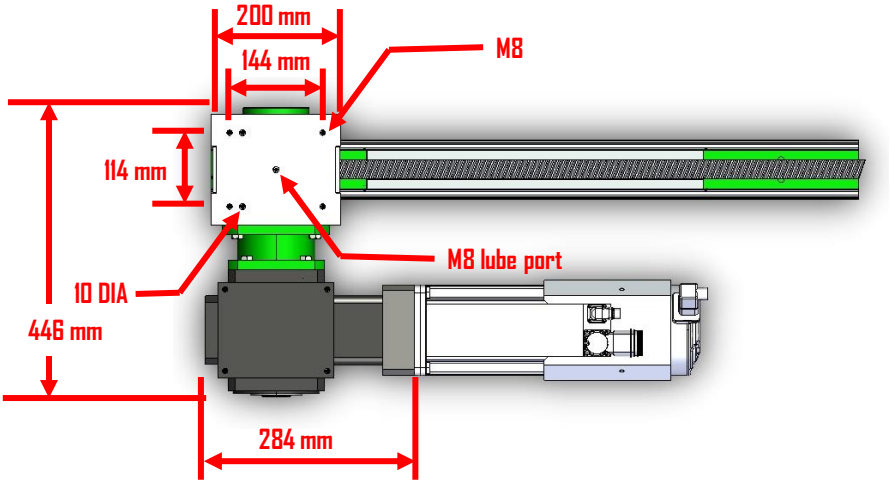
FANGmax DIMENSIONS

motor not included
motor mount is included

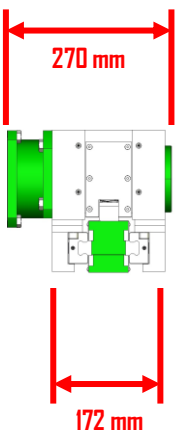
model shown: FANGX2560-S1HB-76SW040-1000RRGX/MOTOR

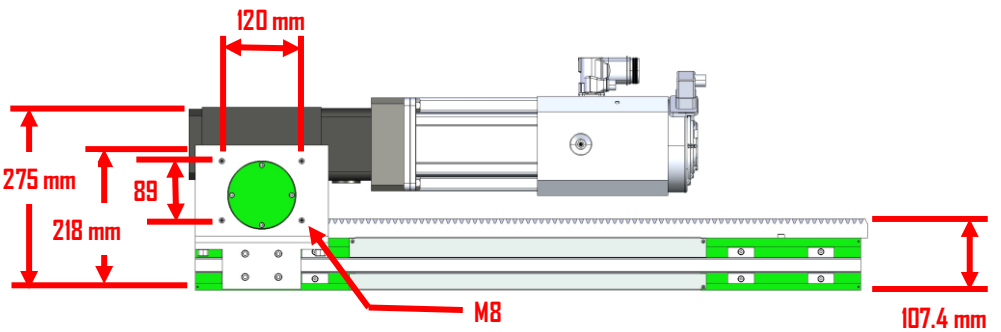
TOP





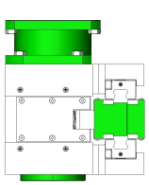
SIDE

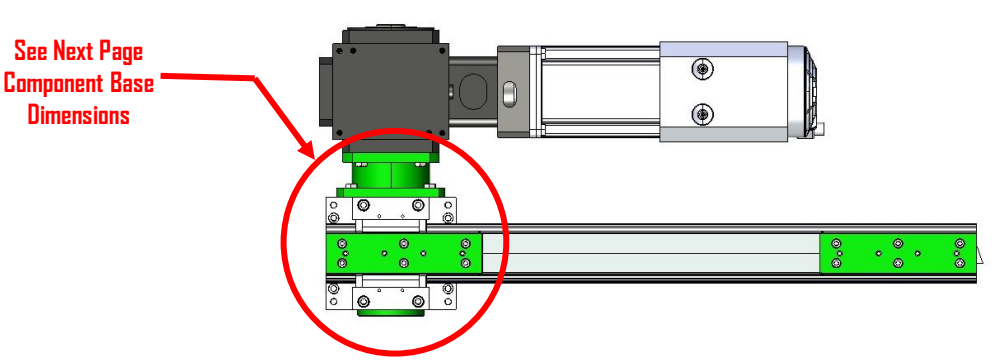




Pinion Pitch dia.	70.030	mm	2.7570	in
Travel per rev	220.000	mm	8.6614	in
Pinion Box Weight	14.000	kg	30.865	kg
Rack Weight	6.000	kg/m	4.032	lb/ft
Rail Weight	3.200	kg/m	2.150	lb/ft
Base Clamp Weight	3.048	kg	6.720	lb

BOTTOM

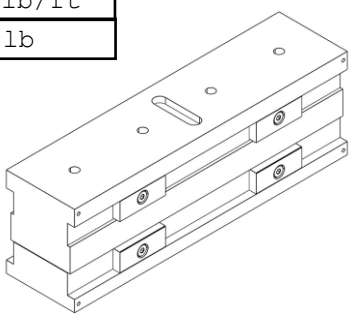


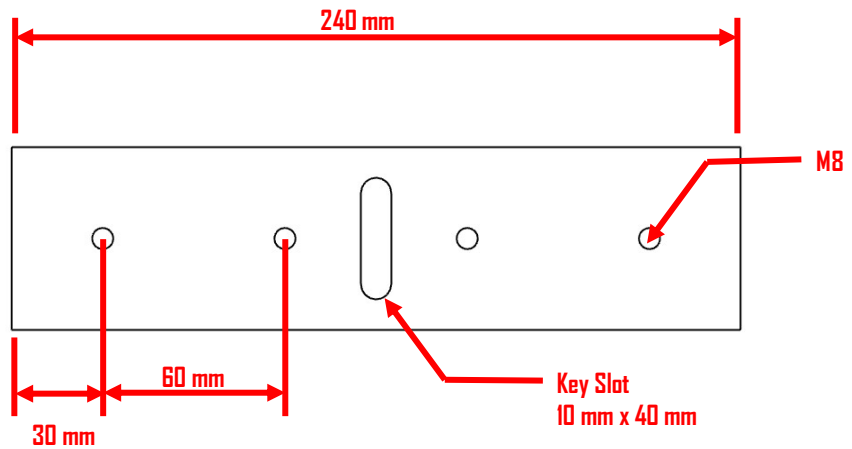


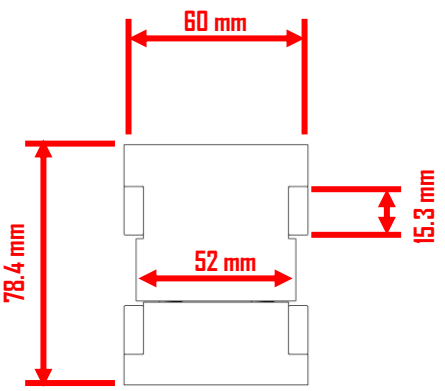
FANGclamp STANDARD "FCB" CLAMP BASE DIMENSIONS

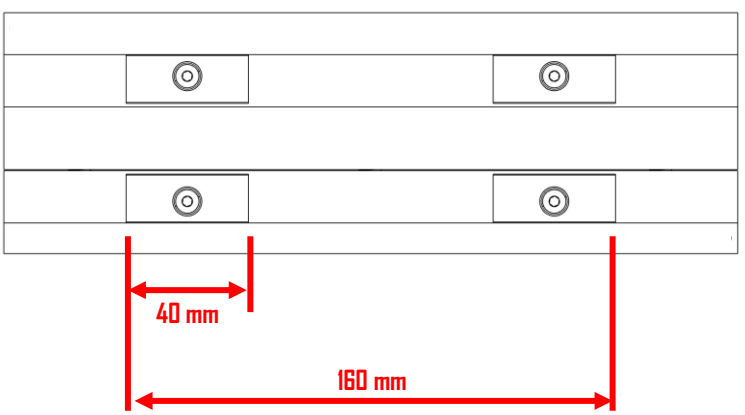
Standard model shown: FCB60MAX

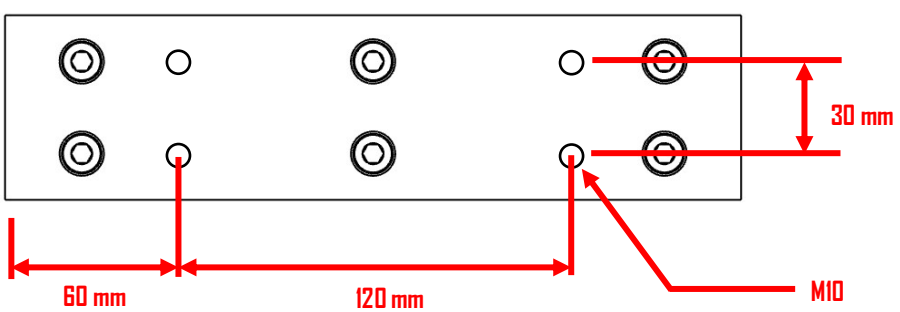
Pinion Pitch dia.	70.030	mm	2.7570	in
Travel per rev	220.000	mm	8.6614	in
Pinion Box Weight	14.000	kg	30.865	kg
Rack Weight	6.000	kg/m	4.032	lb/ft
Rail Weight	3.200	kg/m	2.150	lb/ft
Base Clamp Weight	3.048	kg	6.720	lb











FANGmax GEARBOX TECHNICAL DATA

* FANG2560 Max Input Torque = 580 Nm (5133 lb-in)
* Servo Worm Gear Values Based on 3000 rpm input

Type		Servo Worm Gear*					Ultra Worm*
Series	RATIO	38SW	51SW	64SW	76SW	89SW	T5SW
Nom Output Torque (T2n)	4.75:1	NA	NA	NA	NA	NA	520 (4620)
	5:1	29 (260)	54 (480)	100 (850)	130 (1110)	260 (2300)	NA
	6:1	NA	61 (540)	150 (1350)	170 (1480)	290 (2580)	NA
	6.75:1	NA	NA	NA	NA	NA	520 (4620)
	7:1	NA	64 (570)	110 (1000)	270 (2370)	310 (2740)	NA
	8:1	NA	68 (600)	120 (1060)	200 (1740)	330 (2950)	NA
	9:1	NA	69 (520)	120 (1060)	200 (1740)	340 (3050)	NA
	9.25:1	NA	NA	NA	NA	NA	520 (4620)
Nm (lb-in)	10:1	38 (340)	71 (630)	130 (1110)	210 (1870)	360 (3170)	NA
	15:1	40 (354)	75 (660)	130 (1110)	220 (1950)	370 (3280)	NA
	20:1	40 (354)	73 (650)	130 (1150)	220 (1950)	370 (3280)	NA
	25:1	NA	73 (650)	130 (1150)	220 (1950)	370 (3280)	NA
	30:1	37 (330)	70 (620)	120 (1060)	210 (1870)	350 (3130)	NA
	40:1	34 (300)	67 (590)	120 (1060)	200 (1740)	350 (3130)	NA
	50:1	34 (300)	64 (570)	110 (1000)	190 (1700)	330 (2880)	NA
	60:1	32 (280)	62 (550)	110 (1000)	180 (1630)	310 (2760)	NA
Max Acceleration Output Torque (T2n)	4.75:1	NA	NA	NA	NA	NA	870 (7700)
	5:1	46 (407)	90 (796)	170 (1504)	310 (2743)	480 (4248)	NA
	6:1	NA	99 (876)	180 (1593)	320 (2832)	540 (4779)	NA
	6.75:1	NA	NA	NA	NA	NA	870 (7700)
	7:1	NA	110 (973)	190 (1681)	320 (2832)	520 (4602)	NA
	8:1	NA	110 (973)	210 (1859)	310 (2743)	600 (5310)	NA
	9:1	NA	110 (973)	210 (1859)	350 (3098)	620 (5487)	NA
	9.25:1	NA	NA	NA	NA	NA	870 (7700)
Nm (lb-in)	10:1	59 (522)	120 (1062)	210 (1859)	370 (3275)	640 (5664)	NA
	15:1	60 (531)	120 (1062)	220 (1947)	380 (3363)	660 (5841)	NA
	20:1	60 (531)	120 (1062)	220 (1947)	370 (3275)	660 (5841)	NA
	25:1	NA	120 (1062)	220 (1947)	370 (3275)	650 (5753)	NA
	30:1	52 (460)	110 (973)	210 (1859)	360 (3186)	620 (5487)	NA
	40:1	52 (460)	110 (973)	200 (1770)	340 (3009)	590 (5222)	NA
	50:1	52 (460)	100 (885)	190 (1681)	330 (2832)	570 (5045)	NA
	60:1	42 (372)	100 (885)	180 (1593)	320 (2832)	550 (4868)	NA

FANGmax GEARBOX TECHNICAL DATA

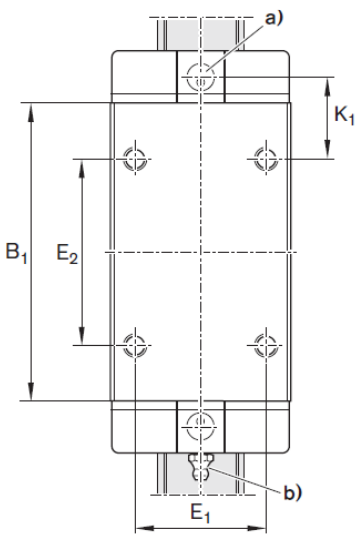
* Servo Worm Gear Values Based on 3000 rpm input

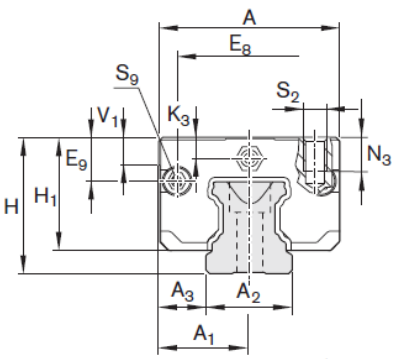
Type		Servo Worm Gear*					Ultra Worm*
Series	RATIO	38SW	51SW	64SW	76SW	89SW	T5SW
Efficiency %	4.75:1	NA	NA	NA	NA	NA	93
	5:1	87	91	91	91	90	NA
	6:1	NA	91	91	91	90	NA
	6.75:1	NA	NA	NA	NA	NA	90
	7:1	NA	90	90	90	90	NA
	8:1	NA	90	90	89	89	NA
	9:1	NA	89	89	89	89	NA
	9.25:1	NA	NA	NA	NA	NA	88
	10:1	85	89	89	89	88	NA
	15:1	83	87	87	87	86	NA
	20:1	80	84	84	84	83	NA
	25:1	NA	83	83	83	82	NA
	30:1	75	79	79	79	78	NA
	40:1	71	75	75	75	74	NA
	50:1	68	71	71	71	71	NA
	60:1	65	69	69	69	68	NA
Mass Moment of Inertia(In)	4.75:1	NA	NA	NA	NA	NA	22.93
	5:1	1.26	2.31	8.38	14.40	24.80	NA
	6:1	NA	2.10	7.82	12.50	23.30	NA
	6.75:1	NA	NA	NA	NA	NA	12.88
	7:1	NA	1.97	7.45	11.30	17.60	NA
	8:1	NA	1.90	7.26	10.60	15.80	NA
	9:1	NA	1.84	7.11	10.10	14.60	NA
Kg cm²	9.25:1	NA	NA	NA	NA	NA	8.10
	10:1	1.09	1.80	7.10	9.73	13.80	NA
	15:1	1.06	1.71	6.75	8.87	11.70	NA
	20:1	1.05	1.67	6.67	8.57	11.00	NA
	25:1	NA	1.66	6.62	8.43	10.70	NA
	30:1	1.04	1.65	6.62	8.35	10.50	NA
	40:1	1.04	1.64	6.58	8.28	10.30	NA
	50:1	1.04	1.64	6.57	8.24	10.20	NA
	60:1	1.04	1.64	6.56	8.22	10.20	NA

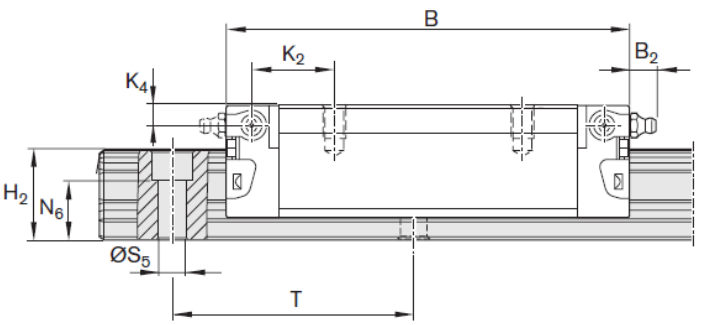
FANGmax GEARBOX TECHNICAL DATA

Type	Servo Worm Gear*					Ultra Worm*
Series	38SW	51SW	64SW	76SW	89SW	T5SW
Nom Input Speed (n1n)	3000	2500	3000	2500	2500	2500
Max Input Speed (1max)	6000	5000	6000	5000	5000	5000
1 STAGE arc-min	<8	<6	<5	<4	<3	<1
NOTE: Active Zero Backlash is available for a price premium but may affect upper speed limits						
Weight (m) kg (lb) 1 STAGE	4.1 (9)	8.2 (18)	14.5 (32)	25.4 (56)	49.9 (110)	38 (83.7)
Average Service Life	> 25,000 hours					> 12,000 hours
Lubrication	Synthetic Gear Oil					Synthetic Grease
Protection Rating	Mobil SHC 634					Klubersynth GH6-220
Operating Temperature	IP65					IP67
	-25 to 100 C					-25 to 90 C

RUNNER BLOCK / GUIDE CAR SPECIFICATIONS SIZE 25







Brand	Model	Dimensions							Ratings	
		A	A_2	B	H	H_2	E_1	E_2	C_d(N)	C_0(N)
Bosch Rexroth	1623-214-20	48	23	107.9	36	24.45	35	50	37300	52500
THK	SHS25LV	48	23	109.0	36	20.00	35	50	29208	64700
Hiwin	LGH25HA	48	23	104.6	*40	20.00	35	50	24986	50800
IKO	MMSGG25	48	23	118.0	36	22.00	35	50	24446	38300
INA	KUSE25BHL	48	23	104.3	*40	21.70	35	50	35300	93700
NSK	LY25BN	48	23	107.0	*40	22.00	35	50	27383	71000
Thomson	500D25	48	23	103.5	36	22.70	35	50	25500	60300
Ewellix (SKF)	LLRHS25U	48	23	107.9	36	22.00	35	50	24400	44600

FANGTOOTH REFERENCE MOTION PROFILES TO USED WITH FANGmax HEAVY AXIS SELECTION TABLES

500 mm MOVES

SECTION 00 [500mm of Travel – 16.68 inches]

Profile #	Total Time	Accel Time	Decel Time	Speed	Acceleration	Max Motor Speed	Gearbox Ratio
00.01	2.20 sec	0.10 sec	0.10 sec	0.25 m/s	2.5 m/s2	681.80 rpm	10:1
00.02	1.20 sec	0.20 sec	0.20 sec	0.50 m/s	2.5 m/s2	1363.60 rpm	10:1
00.03	0.60 sec	0.10 sec	0.10 sec	1.00 m/s	10 m/s2	2727.20 rpm	10:1
00.04	0.40 sec	0.12 sec	0.12 sec	1.78 m/s	15 m/s2	2420.40 rpm	5:1

1000 mm MOVES

SECTION 01 [1000mm of Travel – 39.37 inches]

Profile #	Total Time	Accel Time	Decel Time	Speed	Acceleration	Max Motor Speed	Gearbox Ratio
01.01	4.20 sec	0.10 sec	0.10 sec	0.25 m/s	2.5 m/s2	681.80 rpm	10:1
01.02	2.20 sec	0.10 sec	0.10 sec	0.50 m/s	5.0 m/s2	1363.60 rpm	10:1
01.03	1.20 sec	0.20 sec	0.20 sec	1.00 m/s	5.0 m/s2	2727.20 rpm	10:1
01.04	0.60 sec	0.10 sec	0.10 sec	2.00 m/s	20.0 m/s2	2727.20 rpm	5:1
01.05	0.43 sec	0.10 sec	0.10 sec	3.00 m/s	30.0 m/s2	4090.80 rpm	5:1

2500 mm MOVES

SECTION 03 [2500mm of Travel – 98.43 inches]

Profile #	Total Time	Accel Time	Decel Time	Speed	Acceleration	Max Motor Speed	Gearbox Ratio
03.01	10.25 sec	0.250 sec	0.250 sec	0.25 m/s	1.0 m/s2	681.80 rpm	10:1
03.02	5.25 sec	0.250 sec	0.250 sec	0.50 m/s	2.0 m/s2	1363.60 rpm	10:1
03.03	2.50 sec	0.250 sec	0.250 sec	1.00 m/s	4.0 m/s2	2727.20 rpm	10:1
03.04	1.25 sec	0.125 sec	0.125 sec	2.00 m/s	16.0 m/s2	2727.20 rpm	5:1
03.05	0.87 sec	0.100 sec	0.100 sec	3.00 m/s	30.0 m/s2	4090.80 rpm	5:1

FANGmax Linear Axis Weight	500mm (2 bases) 1 RAIL	500mm (2 bases) 2 RAILS	1000mm (3 bases) 1 RAIL	1000mm (3 bases) 2 RAILS	2500mm (7 bases) 1 RAIL	2500mm (7 bases) 2 RAILS
kg	7.80	9.40	18.80	22.00	79.00	87.00
lbs	17.20	20.72	41.45	48.50	174.16	191.80

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 "14"
Pinion Pitch Diameter 70.03 mm
Pinion Max Torque 580 Nm
Doesn't Include Motor Inertia

MAXIMUM INPUT TORQUE REQUIREMENTS

FANGmax HEAVY AXIS HORIZONTAL MOVES

Total Weight Includes Fangtooth Moving Parts Weight

SECTION 00 [500mm of Travel – 16.68 inches] HORIZONTAL ← 500 mm →

USING SERVO WORM SIZE "51SW" 10:1 Gear Ratio [Gearbox Inertia 1.8 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
2.20 sec	0.25 m/s	00.01	0.56 Nm	0.99 Nm	1.85 Nm	3.57 Nm	7.02 Nm	-
1.20 sec	0.50 m/s	00.02	0.56 Nm	0.99 Nm	1.85 Nm	3.57 Nm	7.02 Nm	-
0.60 sec	1.00 m/s	00.03	2.04 Nm	3.55 Nm	6.57 Nm	12.60 Nm	-	-

USING SERVO WORM SIZE "51SW" 5:1 Gear Ratio [Gearbox Inertia 2.31 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.40 sec	1.78 m/s	00.04	5.01 Nm	9.48 Nm	18.42 Nm	-	-	-

USING SERVO WORM SIZE "76SW" 5:1 Gear Ratio [Gearbox Inertia 14.40 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.60 sec	1.00 m/s	00.03	-	-	-	-	50.38 Nm	-
0.40 sec	1.78 m/s	00.04	-	-	-	38.90 Nm	-	-

USING SERVO WORM SIZE "89SW" 5:1 Gear Ratio [Gearbox Inertia 24.80 kgcm²]

Total Time	Speed	Profile #	75 lbs	50 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.60 sec	1.00 m/s	00.03	-	-	-	-	-	100.16 Nm
0.40 sec	1.78 m/s	00.04	-	-	-	-	76.88 Nm	-

SECTION 01 [1000mm of Travel – 39.37 inches] HORIZONTAL ← 1000 mm →

USING SERVO WORM SIZE "51SW" 10:1 Gear Ratio [Gearbox Inertia 1.8 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
4.20 sec	0.25 m/s	01.01	0.56 Nm	0.99 Nm	1.85 Nm	3.57 Nm	7.02 Nm	-
2.20 sec	0.50 m/s	01.02	1.05 Nm	1.84 Nm	3.42 Nm	6.58 Nm	12.90 Nm	-
1.20 sec	1.00 m/s	01.03	1.05 Nm	1.84 Nm	3.42 Nm	6.58 Nm	12.90 Nm	-
0.60 sec	2.00 m/s	01.04	4.01 Nm	6.96 Nm	12.85 Nm	-	-	-

USING SERVO WORM SIZE "51SW" 5:1 Gear Ratio [Gearbox Inertia 2.31 kgcm²]

Total Time	Speed	Profile #	75 lbs	150lbs	300 lbs	600lbs	1200 lbs	2400lbs
0.43 sec	3.00 m/s	01.05	9.85 Nm	18.63 Nm	-	-	-	-

USING SERVO WORM SIZE "76SW" 10:1 Gear Ratio [Gearbox Inertia 9.73 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
2.20 sec	0.50 m/s	01.02	-	-	-	-	-	27.34 Nm
1.20 sec	1.00 m/s	01.03	-	-	-	-	-	27.34 Nm
0.60 sec	2.00 m/s	01.04	-	-	-	29.17 Nm	-	-

USING SERVO WORM SIZE "76SW" 5:1 Gear Ratio [Gearbox Inertia 14.40 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.43 sec	3.00 m/s	01.05	-	-	41.36 Nm		-	-

USING SERVO WORM SIZE "89SW" 5:1 Gear Ratio [Gearbox Inertia 23.30 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.60	2.00 m/s	01.04	-	-	-	-	101.05 Nm	-

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 "14"
Pinion Pitch Diameter 70.03 mm
Pinion Max Torque 580 Nm
Doesn't Include Motor Inertia

MAXIMUM INPUT TORQUE REQUIREMENTS

FANGmax HEAVY AXIS HORIZONTAL MOVES

Total Weight Includes Fangtooth Moving Parts Weight

SECTION 03 [2500mm of Travel – 98.43 inches] HORIZONTAL ← 2500 mm →

USING SERVO WORM SIZE "51SW" 10:1 Gear Ratio [Gearbox Inertia 1.8 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
10.25 sec	0.25 m/s	03.01	0.27 Nm	0.48 Nm	0.91 Nm	1.77 Nm	3.48 Nm	6.91 Nm
5.25 sec	0.50 m/s	03.02	0.46 Nm	0.82 Nm	1.54 Nm	2.97 Nm	5.84 Nm	11.57 Nm
2.50 sec	1.00 m/s	03.03	0.86 Nm	1.50 Nm	2.80 Nm	5.38 Nm	10.55 Nm	-

USING SERVO WORM SIZE "51SW" 5:1 Gear Ratio [Gearbox Inertia 2.31 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
1.25 sec	2.00 m/s	03.04	5.32 Nm	10.07 Nm	-	-	-	-

USING SERVO WORM SIZE "64SW" 5:1 Gear Ratio [Gearbox Inertia 8.38 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.87 sec	3.00 m/s	03.05	12.46 Nm	21.23 Nm	-	-	-	-

USING SERVO WORM SIZE "76SW" 10:1 Gear Ratio [Gearbox Inertia 9.43 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	3500 lbs	600 lbs	1200 lbs	2400 lbs
2.50 sec	1.00 m/s	03.03	-	-	-	-	-	21.76 Nm

USING SERVO WORM SIZE "76SW" 5:1 Gear Ratio [Gearbox Inertia 14.40 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
1.25 sec	2.00 m/s	03.04	-	-	22.32 Nm	41.30 Nm	-	-
0.87 sec	3.00 m/s	03.05	-	-	41.36 Nm	-	-	-

USING SERVO WORM SIZE "89SW" 5:1 Gear Ratio [Gearbox Inertia 23.30 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
1.25 sec	2.00 m/s	03.04	-	-	-	-	81.29 Nm	-

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 "14"
Pinion Pitch Diameter 70.03 mm
Pinion Max Torque 580 Nm
Doesn't Include Motor Inertia

MAXIMUM INPUT TORQUE REQUIREMENTS

FANGmax HEAVY AXIS VERTICAL MOVES

Total Weight Includes Fangtooth Moving Parts Weight

SECTION 00 [500mm of Travel – 16.68 inches] VERTICAL

USING SERVO WORM SIZE "51SW" 10:1 Gear Ratio [Gearbox Inertia 1.8 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
2.20 sec	0.25 m/s	00.01	1.90 Nm	3.67 Nm	7.22 Nm	-	-	-
1.20 sec	0.50 m/s	00.02	1.90 Nm	3.67 Nm	7.22 Nm	-	-	-
0.60 sec	1.00 m/s	00.03	3.38 Nm	6.23 Nm	11.93 Nm	-	-	-

USING SERVO WORM SIZE "51SW" 5:1 Gear Ratio [Gearbox Inertia 9.73 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.40 sec	1.78 m/s	00.04	7.70 Nm	-	-	-	-	-

USING SERVO WORM SIZE "76SW" 10:1 Gear Ratio [Gearbox Inertia 9.73 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
2.20 sec	0.25 m/s	00.01	-	-	-	14.87 Nm	29.03 Nm	-
1.20 sec	0.50 m/s	00.02	-	-	-	14.87 Nm	29.03 Nm	-
0.60 sec	1.00 m/s	00.03	-	-	-	25.59 Nm	-	-

USING SERVO WORM SIZE "76SW" 10:1 Gear Ratio [Gearbox Inertia 9.73 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.40 sec	1.78 m/s	00.04	-	17.44 Nm	31.74 Nm	-	-	-

USING SERVO WORM SIZE "89SW" 10:1 Gear Ratio [Gearbox Inertia 13.80 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
2.20 sec	0.25 m/s	00.01	-	-	-	-	-	57.66 Nm
1.20 sec	0.50 m/s	00.02	-	-	-	-	-	57.66 Nm
0.60 sec	1.00 m/s	00.03	-	-	-	-	48.56 Nm	-

USING SERVO WORM SIZE "89SW" 5:1 Gear Ratio [Gearbox Inertia 23.30 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.40 sec	1.78 m/s	00.04	-	-	-	62.26 Nm	119.47 Nm	-

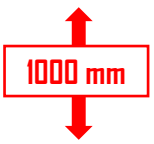
Warning: As this is only a general guide, to ensure acceptable system life please call Fangtooth Application Engineering with full duty cycle to verify.

Based on weight & Motion Profile from page "14"
Pinion Pitch Diameter 70.03 mm
Pinion Max Torque 580 Nm
Doesn't Include Motor Inertia

MAXIMUM INPUT TORQUE REQUIREMENTS

FANGmax HEAVY AXIS VERTICAL MOVES

Total Weight Includes Fangtooth Moving Parts Weight



SECTION 01 [1000mm of Travel – 39.37 inches] VERTICAL

USING SERVO WORM SIZE "51SW" 10:1 Gear Ratio [Gearbox Inertia 1.8 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
4.20 sec	0.25 m/s	01.01	1.90 Nm	3.67 Nm	7.22 Nm	-	-	-
2.20 sec	0.50 m/s	01.02	2.40 Nm	4.53 Nm	8.79 Nm	-	-	-
1.20 sec	1.00 m/s	01.03	2.40 Nm	4.53 Nm	8.79 Nm	-	-	-

USING SERVO WORM SIZE "51SW" 5:1 Gear Ratio [Gearbox Inertia 2.31 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.60 sec	2.00 m/s	01.04	9.30 Nm	-	-	-	-	-
0.43 sec	3.00 m/s	01.05	12.54 Nm	-	-	-	-	-

USING SERVO WORM SIZE "64SW" 10:1 Gear Ratio [Gearbox Inertia 7.0 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
4.20 sec	0.25 m/s	01.01	-	-	-	14.67 Nm	-	-
2.20 sec	0.50 m/s	01.02	-	-	-	18.05 Nm	-	-
1.20 sec	1.00 m/s	01.03	-	-	-	18.05 Nm	-	-

USING SERVO WORM SIZE "64SW" 5:1 Gear Ratio [Gearbox Inertia 8.38 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.60 sec	2.00 m/s	01.04	-	19.61 Nm	36.77 Nm	-	-	-
0.43 sec	3.00 m/s	01.05	-	26.59 Nm	-	-	-	-

USING SERVO WORM SIZE "76SW" 10:1 Gear Ratio [Gearbox Inertia 9.73 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
4.20 sec	0.25 m/s	01.01	-	-	-	-	29.03 Nm	-
2.20 sec	0.50 m/s	01.02	-	-	-	-	35.49 Nm	-
1.20 sec	1.00 m/s	01.03	-	-	-	-	-	-

USING SERVO WORM SIZE "76SW" 5:1 Gear Ratio [Gearbox Inertia 14.40 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.43 sec	3.00 m/s	01.05	-	-	52.08 Nm	-	-	-

USING SERVO WORM SIZE "89SW" 10:1 Gear Ratio [Gearbox Inertia 13.80 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
4.20 sec	0.25 m/s	01.01	-	-	-	-	-	57.66 Nm

USING SERVO WORM SIZE "89SW" 5:1 Gear Ratio [Gearbox Inertia 23.30 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.60 sec	2.00 sec	01.04	-	-	-	75.34 Nm	-	-

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 "14"
Pinion Pitch Diameter 70.03 mm
Pinion Max Torque 580 Nm
Doesn't Include Motor Inertia

MAXIMUM INPUT TORQUE REQUIREMENTS

FANGmax HEAVY AXIS VERTICAL MOVES

Total Weight Includes Fangtooth Moving Parts Weight

SECTION 03 [2500mm of Travel – 98.43 inches] VERTICAL

USING SERVO WORM SIZE "51SW" 10:1 Gear Ratio [Gearbox Inertia 1.8 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
10.25 sec	0.25 m/s	03.01	1.61 Nm	3.16 Nm	6.27 Nm	12.49 Nm	-	-
5.25 sec	0.50 m/s	03.02	1.81 Nm	3.50 Nm	6.90 Nm	-	-	-
2.50 sec	1.00 m/s	03.03	2.20 Nm	4.91 Nm	8.16 Nm	-	-	-

USING SERVO WORM SIZE "51SW" 5:1 Gear Ratio [Gearbox Inertia 2.31 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
1.25 sec	2.00 m/s	03.04	8.01 Nm	15.43 Nm	-	-	-	-
0.87 sec	3.00 m/s	03.05	12.54 Nm	-	-	-	-	-

USING SERVO WORM SIZE "64SW" 10:1 Gear Ratio [Gearbox Inertia 7.0 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
5.25 sec	0.50 m/s	03.02	-	-	-	14.00 Nm	-	-
2.20 sec	1.00 m/s	03.03	-	-	-	16.70 Nm	-	-

USING SERVO WORM SIZE "64SW" 5:1 Gear Ratio [Gearbox Inertia 8.38 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
1.25 sec	2.00 m/s	03.04	-	-	31.67 Nm	-	-	-
0.87 sec	3.00 m/s	03.05	-	26.59 Nm	-	-	-	-

USING SERVO WORM SIZE "76SW" 10:1 Gear Ratio [Gearbox Inertia 9.73 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
10.25 sec	0.25 m/s	03.01	-	-	-	-	25.16 Nm	-
5.25 sec	0.50 m/s	03.02	-	-	-	-	27.74 Nm	-
2.50 sec	1.00 m/s	03.03	-	-	-	-	32.87 Nm	-

USING SERVO WORM SIZE "76SW" 5:1 Gear Ratio [Gearbox Inertia 14.40 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
0.487sec	3.00 m/s	01.05	-	-	52.08 Nm	-	-	-

USING SERVO WORM SIZE "89SW" 10:1 Gear Ratio [Gearbox Inertia 13.80 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
10.25 sec	0.25 m/s	03.01	-	-	-	-	-	50.16 Nm
5.25 sec	0.50 m/s	03.02	-	-	-	-	-	55.16 Nm
2.50 sec	1.00 m/s	03.03	-	-	-	-	-	65.16 Nm

USING SERVO WORM SIZE "89SW" 5:1 Gear Ratio [Gearbox Inertia 23.30 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
1.25 sec	2.00 m/s	01.04	-	-	-	64.79 Nm	-	-

USING SERVO WORM SIZE "T5SW" 4.75:1 Gear Ratio [Gearbox Inertia 22.93 kgcm²]

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
1.25 sec	2.00 m/s	01.04	-	-	-	-	124.11 Nm	-

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

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