BALL SCREWS & NUTS

Duff-Norton has been manufacturing ball screws and nuts for our actuator products for decades, and is now applying those years of experience to bring you an expanded assortment of ball screws and nuts for your application requirements. Consider these advantages:

Multiple Leads

Multiple Diameters

FEATURES & BENEFITS

Performance

- Excellent performance ratings; over 90% efficient with low torque and power requirements. Long and predictable life ratings.

Quality

- Excellent quality, all screws are precision rolled, heat-treated, inspected, and then manganese phosphate or black oxide coated. Good lead accuracy.

Delivery

- In stock on the most popular sizes.

Broad Assortment

- We offer a very broad assortment of acme diameters and leads.

System Integration

- Duff-Norton can provide you with an entire screw and nut system: mounting components, drive components, controls, and protective coverings.

Customer Service

- Talk to one of our knowledgeable customer service agents or application engineers.

www.duffnorton.com
Ph: (800) 477-5002 • Fax: (704) 588-1994

050 - BSE - 050 - X - XXX

Screw Diameter

Code	Diameter
050	1/2"
063	.631"
075	3/4"
100	1"
117	1.17"
150	1 1/2"
200	2"
225	2 1/4"
250	2 1/2"
300	3"
400	4"

Screw Type

Ball

Component Options

Screw
Nut

Total Lead

Thread Pitch
X No. Starts

Code	Leads
020	.200"
025	.250"
041	.413"
047	.473"
050	.500"
066	.660"
100	1.00"
187	1.875"

Screw or Nut Options

Screw Options

A - Alloy or Steel

Nut Options

E - Single, Square
F - Double, Square
G - Single, Round
H - Double, Round
J - Triple, Round

Optional Character

Standard Nut and /or Flange Assembly will contain an "**A**"

LH Thread Nut and Flange Assemblies will contain a "**LA**"

Standard RH Screws cut to length will have no suffix code

Special Screws or Nuts will contain a "**-**"

LH Thread Screws or Nuts will contain a "**L**"

Standard nuts only will have no suffix code

Suffix

Special Screws or Nuts will have a three digit serialized code

Ball Screw & Nut Selection Overview - Right Hand

Screw Dia. (in)	Ball Screw Part Number	Screw Lead (in)	Turns Per Inch	Thread Starts	Standard Length	Root Diameter	Ball Nut Part Number	Ball Nut Description	Flange Part Number
1/2	050BSA020	.200	5	Single RH	6 ft.	.360	050BNH020	Round 2 Circuit	FL0937
	050BSA050	.500	2	Double RH			050BNH050		
.631	063BSA020	.200	5	Single RH	6 ft.	.480	063BNE020	Square 1 Circuit	FL0937
	063BSA100	1.00	1	Double RH			063BNH100	Round 2 Circuit	
3/4	075BSA020	.200	5	Single RH	6 ft.	.660	075BNG020	Round 1 Circiut	FL1137
							075BNH020	Round 2 Circuit	
	075BSA050	.500	2	Double RH		.630	075BNG050		
1	100BSA025	.250	4	Single RH	16 ft.	.840	100BNE025	Square 1 Circuit	FL1563
							100BNF025	Square 2 Circuit	
	100BSA050	.500	2	Double RH		.880	100BNH050	Round 2 Circuit	
	100BSA100	1.00	1	Quad RH		.840	100BNF100	Square 2 Circuit	
1.17	117BSA041	.413	2.421	Single RH	16 ft.	.870	117BNH041	Round 2 Circuit	FL1967
1-1/2	150BSA025	.250	4	Single RH	16 ft.	1.32	150BNH025	Round 2 Circuit	FL1967
	150BSA047	.473	2.114		20 ft.	1.14	150BNH047		FL2548
	150BSA050	.500	2			1.27	150BNH050		FL2360
	150BSA100	1.00	1	Double RH		1.14	150BNF100	Square 2 Circuit	FL2250
							150BNH100	Round 2 Circuit	
	150BSA187	1.875	.53	Quad RH		1.19	150BNF187	Square 2 Circuit	
2	200BSA050	.500	2	Single RH	20 ft.	1.72	200BNH050	Round 2 Circuit	FL3000
	200BSA100	1.00	1	Double RH			200BNH100		
2-1/4	225BSA050	.500	2	Single RH	20 ft.	1.85	225BNH050	Round 2 Circuit	FL3137
	225BSA100	1.00	1	Double RH			200BNH100		
3	300BSA066	.660	1.515	Single RH	20 ft.	2.48	300BNJ066	Round 3 Circuit	FL4325
4	400BSA100	1.00	1	Single RH	20 ft.	3.34	400BNJ100	Round 3 Circuit	FL5497

Ball Screw & Nut Selection Overview - Left Hand

Screw Dia. (in)	Ball Screw Part Number	Screw Lead (in)	Turns Per Inch	Thread Starts	Standard Length	Root Diameter	Ball Nut Part Number	Ball Nut Description	Flange Part Number
.631	063BSA020L	.200	5	Single LH	6 ft.	.480	063BNE020L	Square 1 Circuit	FL0937
1	100BSA025L	.250	4		16 ft.	.840	100BNE025L		FL1563
1-1/2	150BSA025L				20 ft.	1.32	150BNH025L	Round 2 Circuit	FL1967
1-1/2	150BSA050L		2			1.27	150BNH050L		FL2360
2-1/4	225BSA050L	.500				1.85	225BNH050L		FL3137

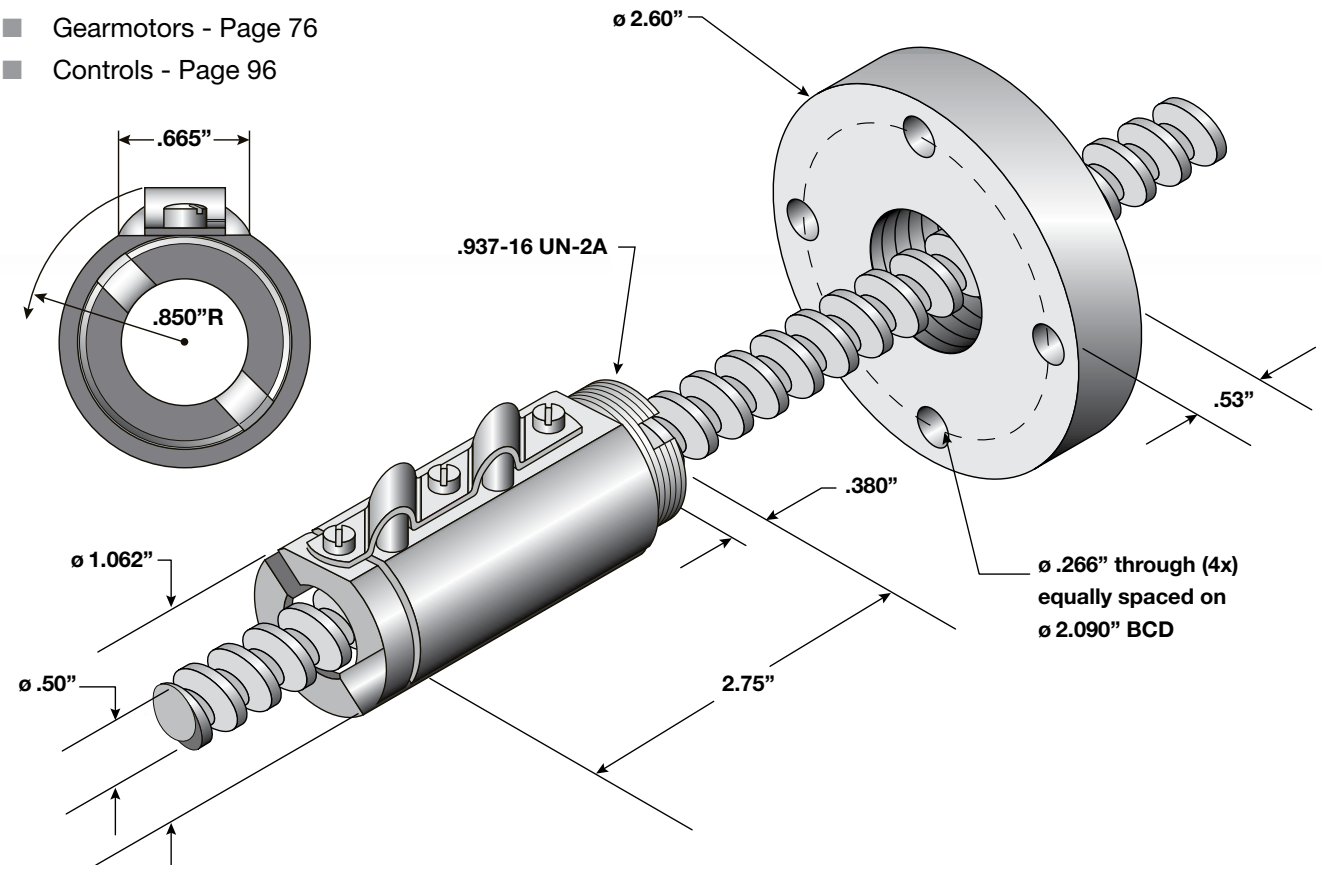
Note: Unless otherwise specified all dimensions are in inches

BALL SCREWS & NUTS

1/2 Inch x .200 Inch (.500 Inch x .200 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 1/2 x .200 Inch (.500 x .200 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
050BSA020	.500	.200	.200	1	.410	Ball RH	Alloy	.002 to .015	Yes	Yes	—
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
050BNH020	9,430	1,200	1200.00	5	+90%	0.035	Steel	.937-16 UN-2A	.380	2.750	1.062
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL0937	2.60	2.090	.266	4	.53	Black Oxide	Steel	.937-16 UN-2B	2	.665	.850

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

*Load ratings are based on what the screw & nut assembly is capable of achieving. Actual load performance for a given screw and nut assembly will vary from application to application.

*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

Please contact our customer service department for assistance.

BALL SCREWS & NUTS

1/2 x .500 Inch (.500 x .500 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

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- End Blocks - Page 66
- Motor Flanges - Page 70
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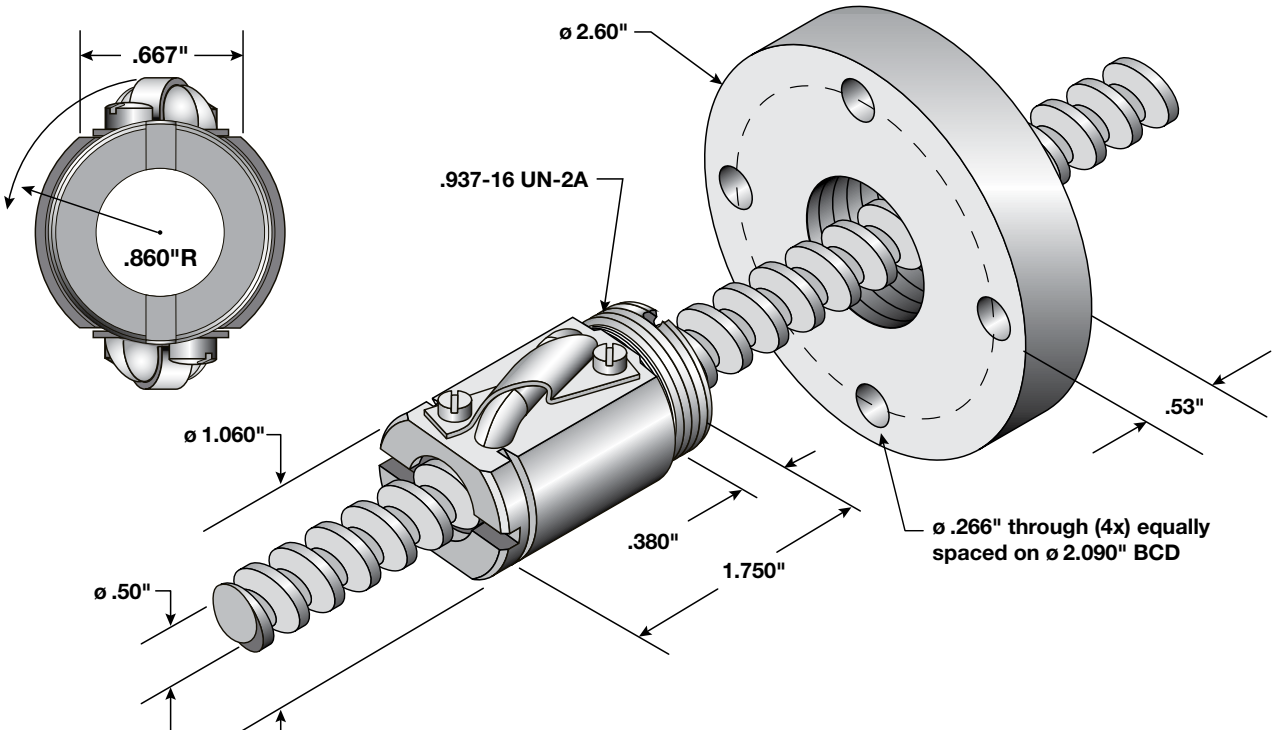

Ball Screw & Nut 1/2 x .500 Inch (.500 x .500 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
050BSA050	.500	.500	.250	2	.410	Ball RH	Alloy	.002 to .015	Yes	Yes	—
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
050BNH050	4,150	929	3000.00	2	+90%	0.088	Steel	.937-16 UN-2A	.380	1.750	1.060
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL0937	2.60	2.090	.266	4	.53	Black Oxide	Steel	.937-16 UN-2B	1	.667	.860

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Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

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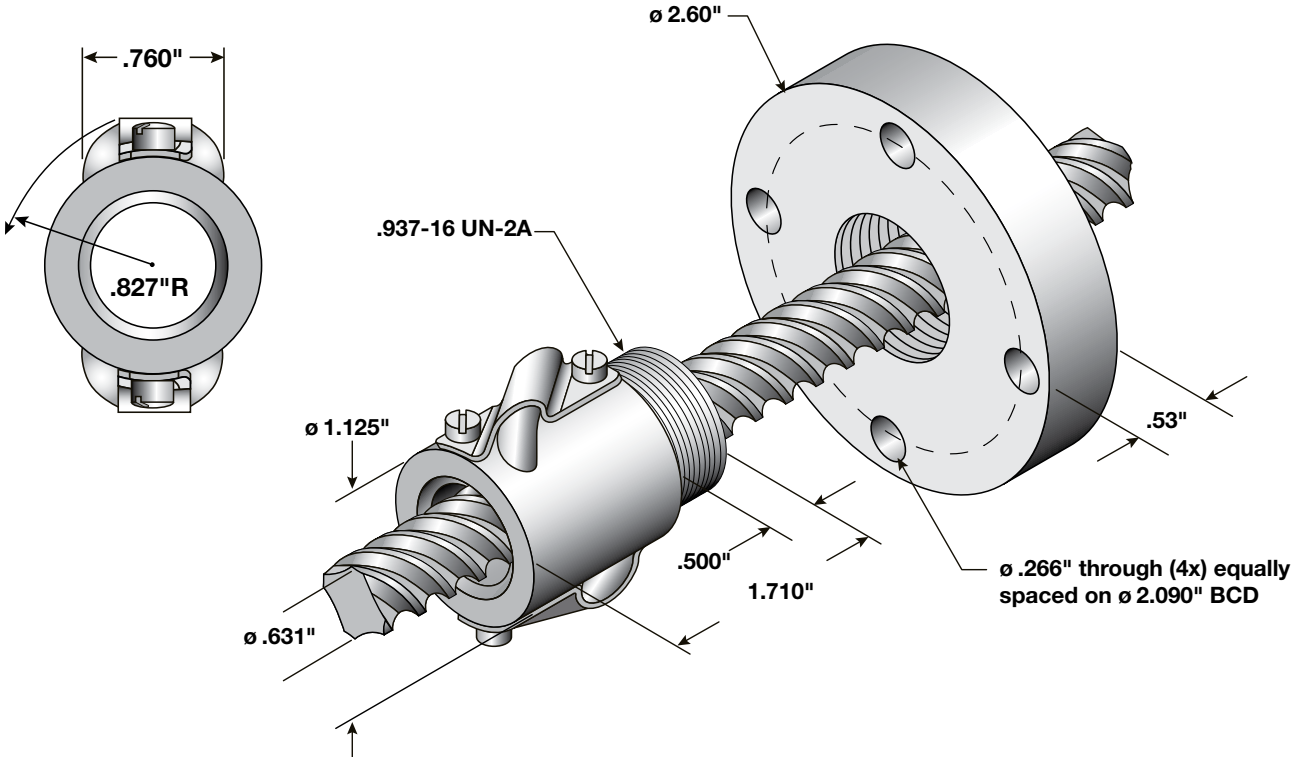

Ball Screw & Nut .631 x 1.00 Inch Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
063BSA100	.631	1.00	.500	2	.480	Ball	Alloy	.002 to .015	Yes	Yes	—
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
063BNH100	2425	578	2377.00	1	+90%	0.177	Steel	.937-16 UN-2A	.500	1.710	1.125
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL0937	2.60	2.090	.266	4	.53	Black Oxide	Steel	.937-16 UN-2B	2	.760	.827

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

Please contact our customer service department for assistance.

.631 x 2.00 Inch - Left Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

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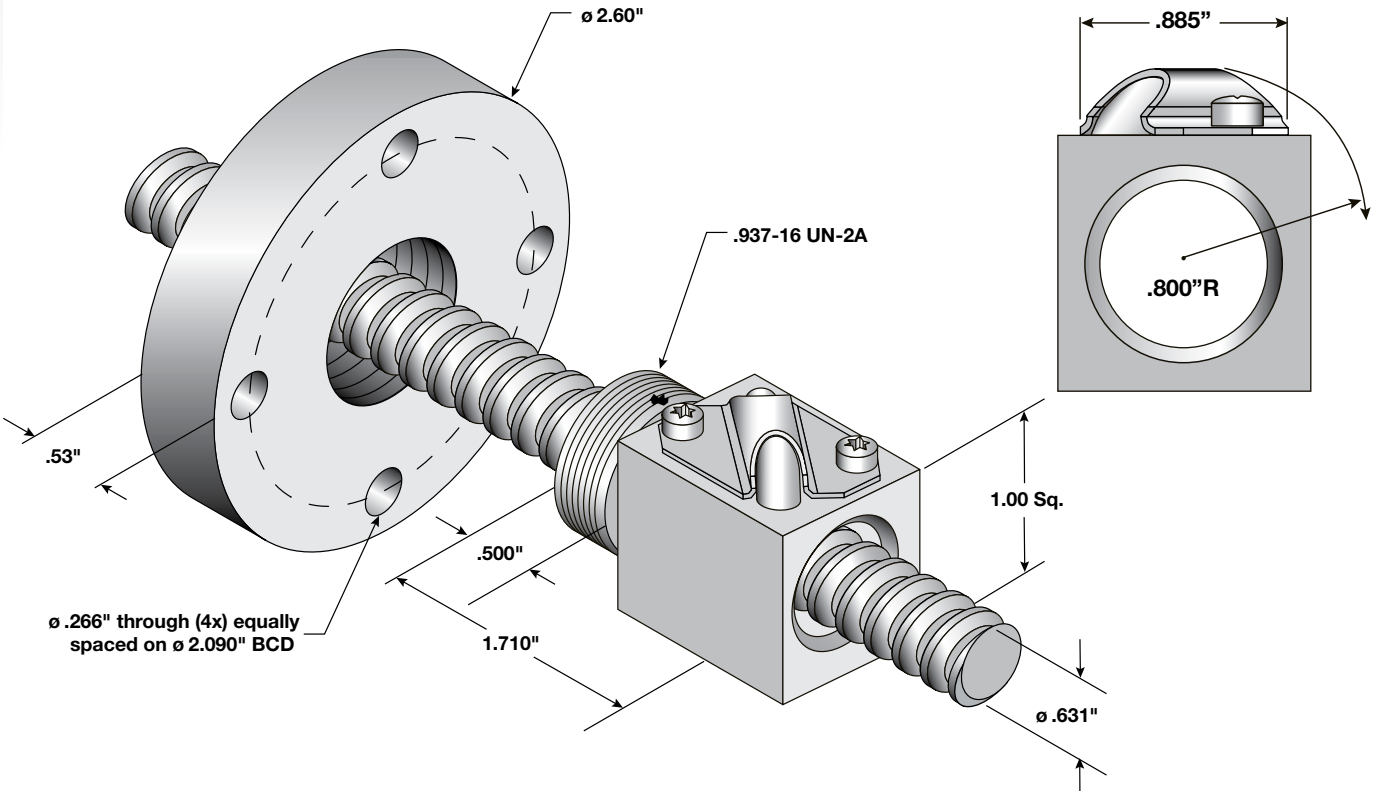

Ball Screw & Nut .631 x 2.00 Inch Diameter - Left Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
063BSA020L	.631	2.00	.200	1	.500	Ball	Alloy	.002 to .015	Yes	Yes	—
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
063BNE020L	6,384	800	951.00	5	+90%	0.035	Steel	.937-16 UN-2A	.500	1.710	1.00 Sq.
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL0937	2.60	2.090	.266	4	.53	Black Oxide	Steel	.937-16 UN-2B	1	.797	.800

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Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

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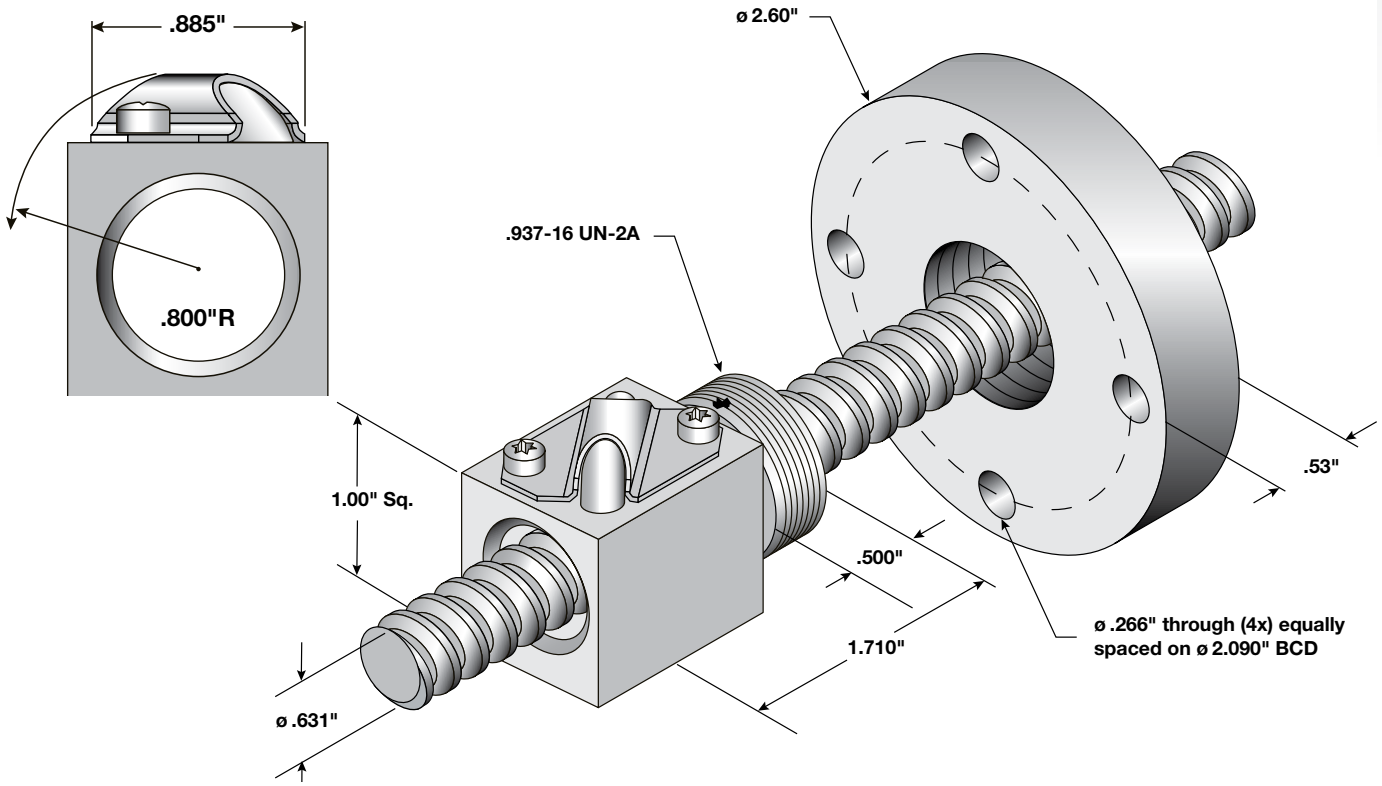

Ball Screw & Nut .631 x 2.00 Inch Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
063BSA020	.631	2.00	.200	1	.500	Ball RH	Alloy	.002 to .015	Yes	Yes	—
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
063BNE020	6,384	800	951.00	5	+90%	0.035	Steel	.937-16 UN-2A	.500	1.710	1.00 Sq.
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL0937	2.60	2.090	.266	4	.53	Black Oxide	Steel	.937-16 UN-2B	1	.797	.800

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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BALL SCREWS & NUTS

3/4 x .200 Inch (.750 x .200 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

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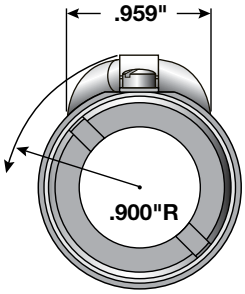
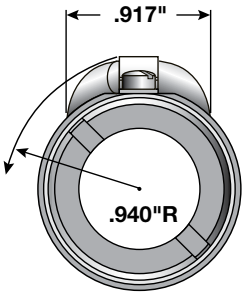
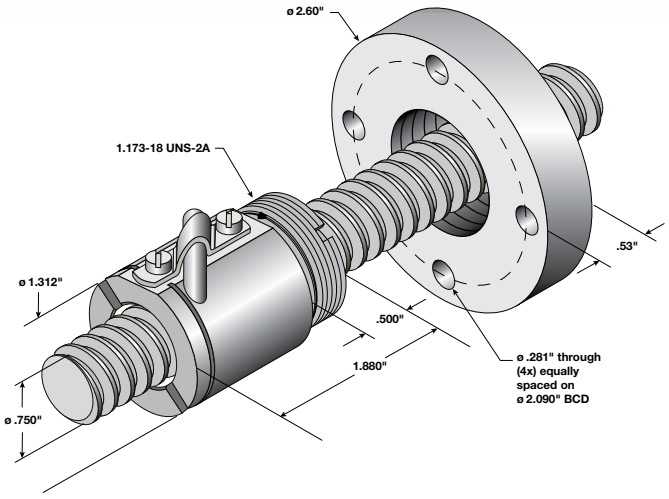
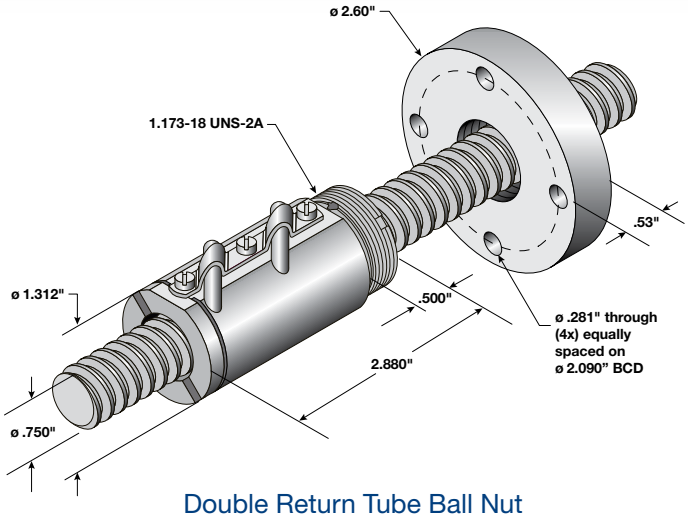






Single Return Tube Ball Nut



Double Return Tube Ball Nut

Ball Screw & Nut 3/4 x .200 (.750 x .200 Inch) Diameter - Right Hand

Ball Screw and Single Return Tube Ball Nut

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
075BSA020	.750	.200	.200	1	.660	Ball RH	Alloy	.002 to .015	Yes	Yes	—
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
075BNG020	7,750	950	800.00	5	+90%	0.035	Steel	1.173-18 UNS-2A	.500	1.880	1.312
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1173	2.60	2.090	.281	4	.53	Black Oxide	Steel	1.173-18 UNS-2B	1	.959	.900

Double Return Tube Ball Nut

Ball Nut	*Static Load	*Dynamic Load	*Max. Speed	T.P.I.	Efficiency	Torque to Raise 1 Lb.	Material	Mounting Thread	Mounting Length	Nut Length	Nut Diameter
075BNH020	18,800	1,900	800.00	5	+90%	0.035	Steel	1.173-18 UNS-2A	.500	2.880	1.312
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1173	2.60	2.090	.281	4	.53	Black Oxide	Steel	1.173-18 UNS-2B	2	.917	.940

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*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

Please contact our customer service department for assistance.

3/4 x .500 Inch (.750 x .500 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

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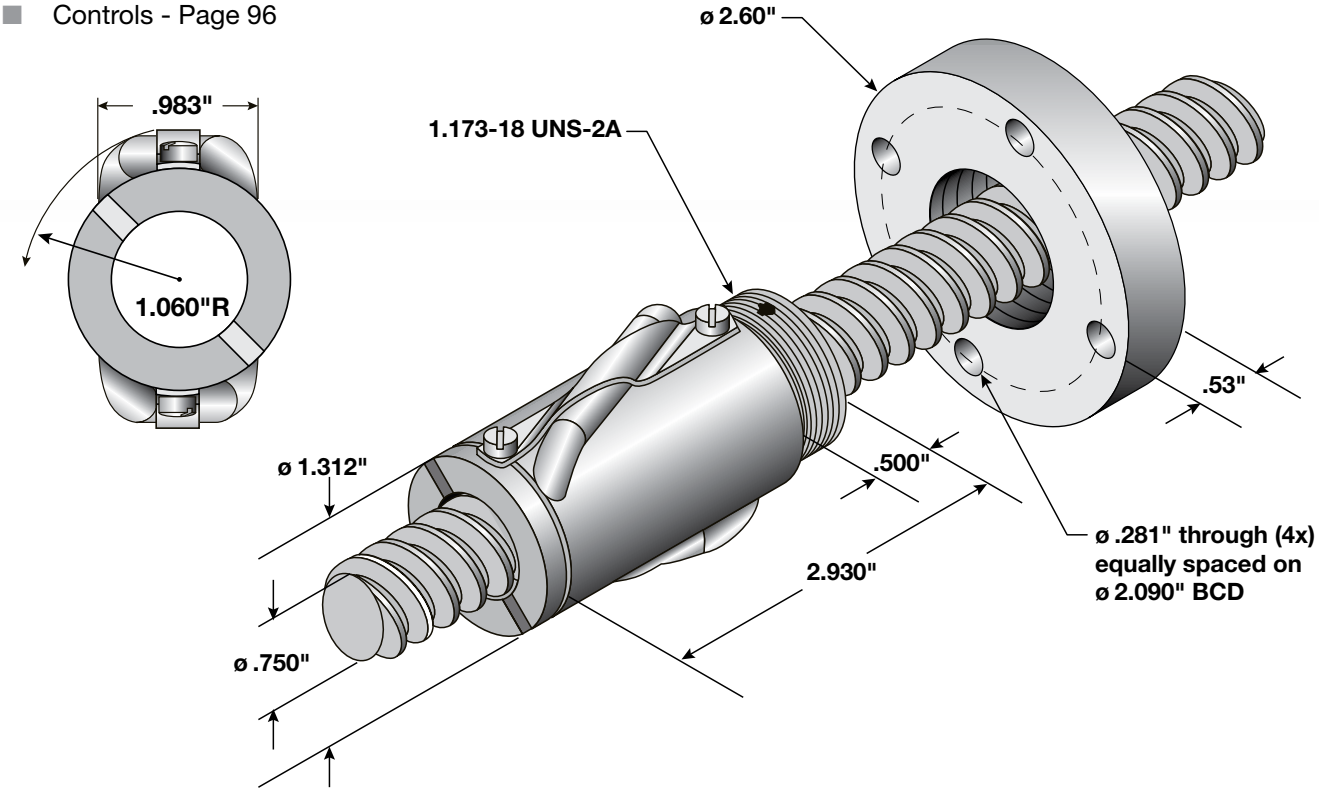

Ball Screw & Nut 3/4 x .500 (.750 x .500 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
075BSA050	.750	.500	.250	2	.630	Ball RH	Alloy	.002 to .015	Yes	Yes	—
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
075BNH050	24,200	3,450	800.00	2	+90%	0.088	Steel	1.173-18 UNS-2A	.500	2.930	1.312
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1173	2.60	2.090	.281	4	.53	Black Oxide	Steel	1.173-18 UNS-2B	2	.983	1.060

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1 x .250 Inch (1.00 x .250 Inch) - Left Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

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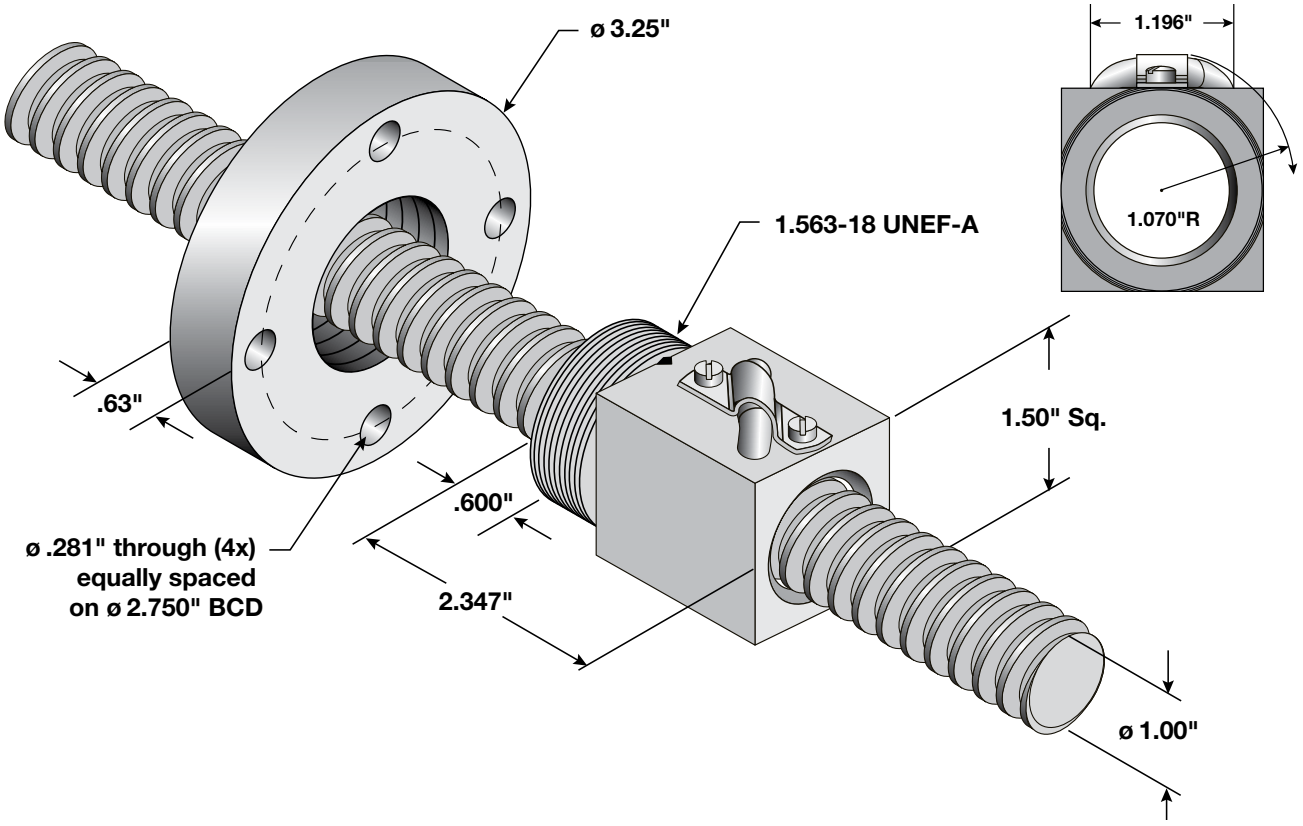

Ball Screw & Nut 1 x .250 (1.00 x .250 Inch) Diameter - Left Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
100BSA025L	1.00	.250	.250	1	.840	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
100BNE025L	15,300	1,612	1200.00	4	+90%	0.044	Steel	1.563-18 UNEF-A	.5600	2.347	1.500 Sq.
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1563	3.25	2.750	.281	4	.63	Black Oxide	Steel	1.563-18 UNEF-B	1	1.195	1.070

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1 x .250 Inch (1.00 x .250 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

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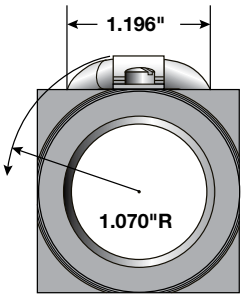
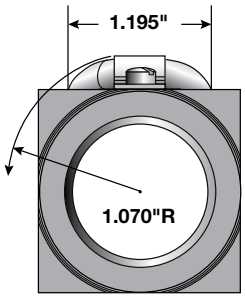
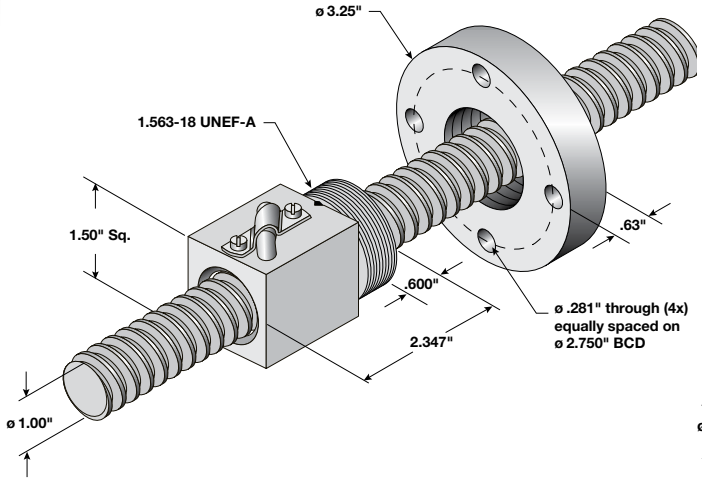
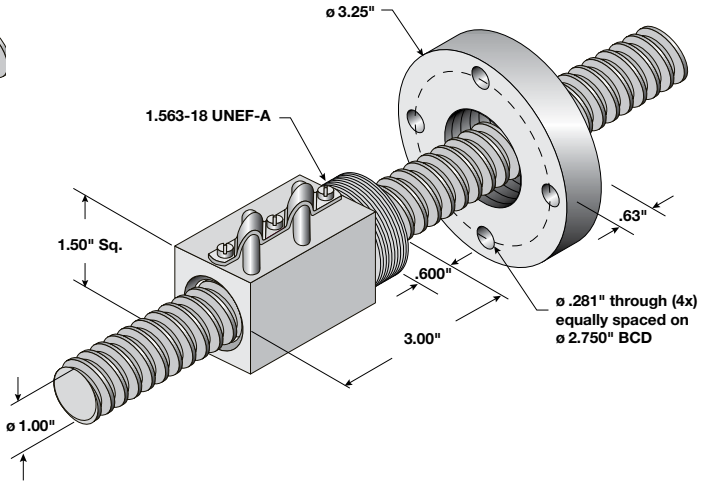








Ball Screw & Nut 1 x .250 (1.00 x .250 Inch) Diameter - Right Hand

Ball Screw and Single Return Tube Ball Nut

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
100BSA025	1.00	.250	.250	1	.840	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
100BNE025	15,300	1,612	1200.00	4	+90%	0.044	Steel	1.563-18 UNEF-A	.600	2.347	1.500 Sq.
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1563	3.25	2.750	.281	4	.63	Black Oxide	Steel	1.563-18 UNEF-B	1	1.195	1.070

Double Return Tube Ball Nut

Ball Nut	*Static Load	*Dynamic Load	*Max. Speed	T.P.I.	Efficiency	Torque to Raise 1 Lb.	Material	Mounting Thread	Mounting Length	Nut Length	Nut Diameter
100BNF025	30,750	3,350	1200.00	4	+90%	0.044	Steel	1.563-18 UNEF-A	.600	3.00	1.500 Sq.
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1563	3.25	2.750	.281	4	.63	Black Oxide	Steel	1.563-18 UNEF-B	2	1.196	1.070

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

*Load ratings are based on what the screw & nut assembly is capable of achieving. Actual load performance for a given screw and nut assembly will vary from application to application.

*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

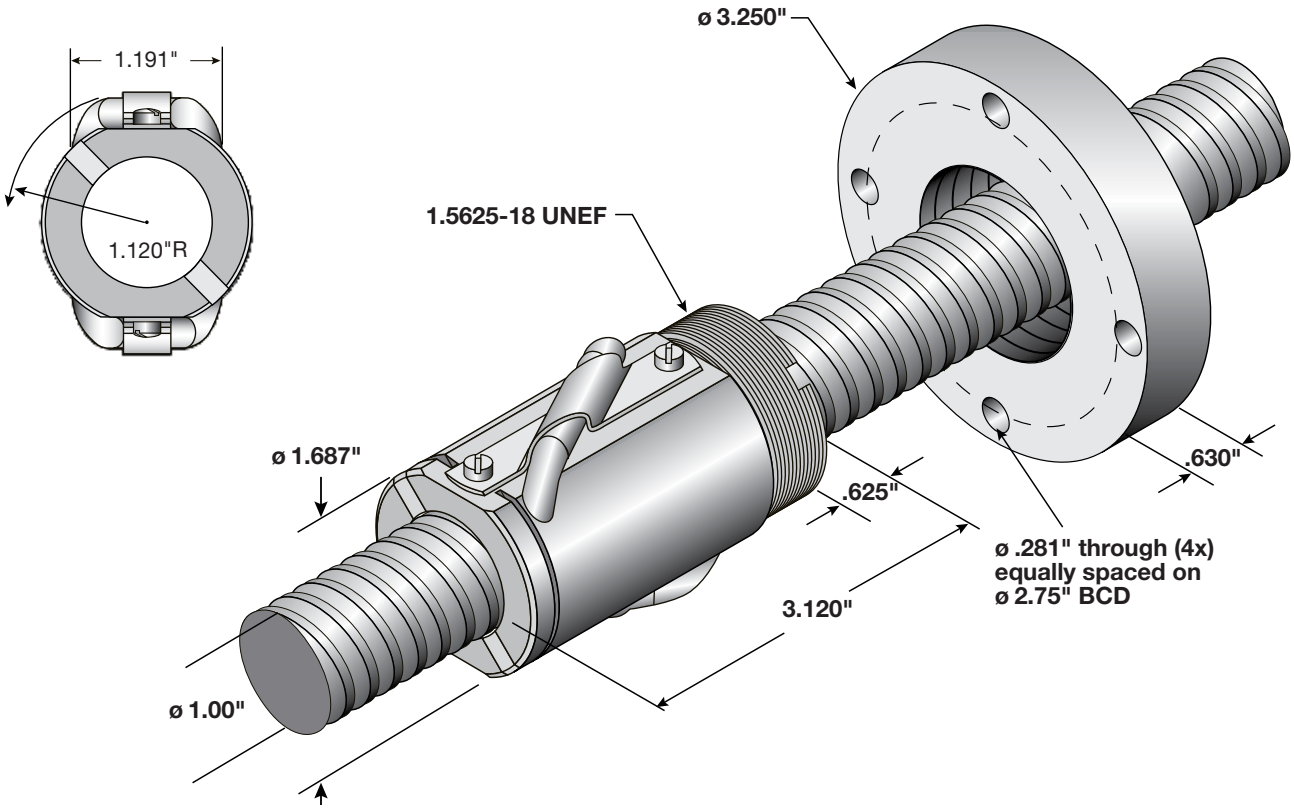
Please contact our customer service department for assistance.

BALL SCREWS & NUTS

1 x .500 Inch (1.00 x .500 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 1 x .500 (1.00 x .500 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
100BSA050	1.00	.500	.250	2	.88	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
100BNH050	32,300	3,950	1500.00	2	+90%	0.089	Steel	1.563-18 UNEF-A	.600	3.120	1.687
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1563	3.25	2.750	.281	4	.63	Black Oxide	Steel	1.563-18 UNEF-B	2	1.191	1.120

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

*Load ratings are based on what the screw & nut assembly is capable of achieving. Actual load performance for a given screw and nut assembly will vary from application to application.

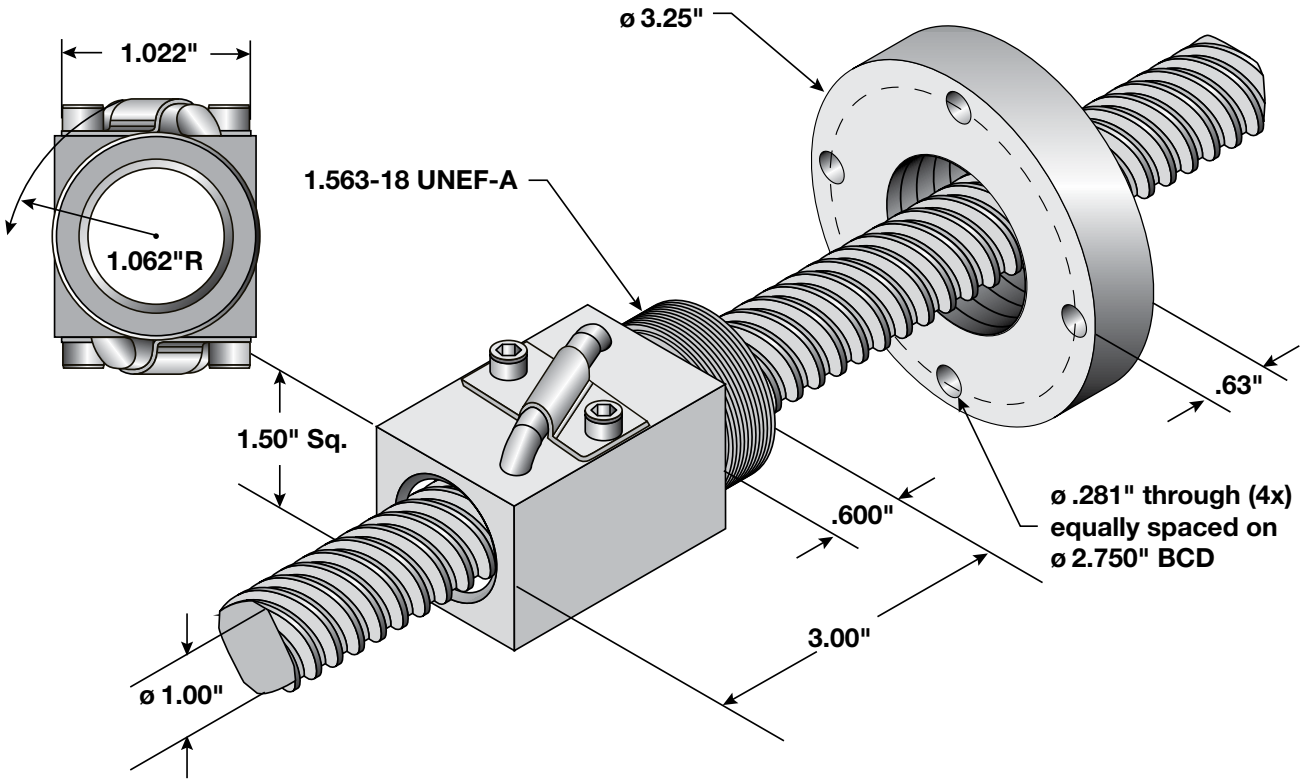
*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

Please contact our customer service department for assistance.

1 x 1.00 Inch (1.00 x 1.00 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 1 x 1.00 (1.00 x 1.00 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
100BSA100	1.00	1.00	.250	4	.840	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
100BNF100	13,600	2,400	750.00	1	+90%	0.177	Steel	1.563-18 UNEF-A	.600	3.00	1.500
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1563	3.25	2.750	.281	4	.63	Black Oxide	Steel	1.563-18 UNEF-B	2	1.022	1.062

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

*Load ratings are based on what the screw & nut assembly is capable of achieving. Actual load performance for a given screw and nut assembly will vary from application to application.

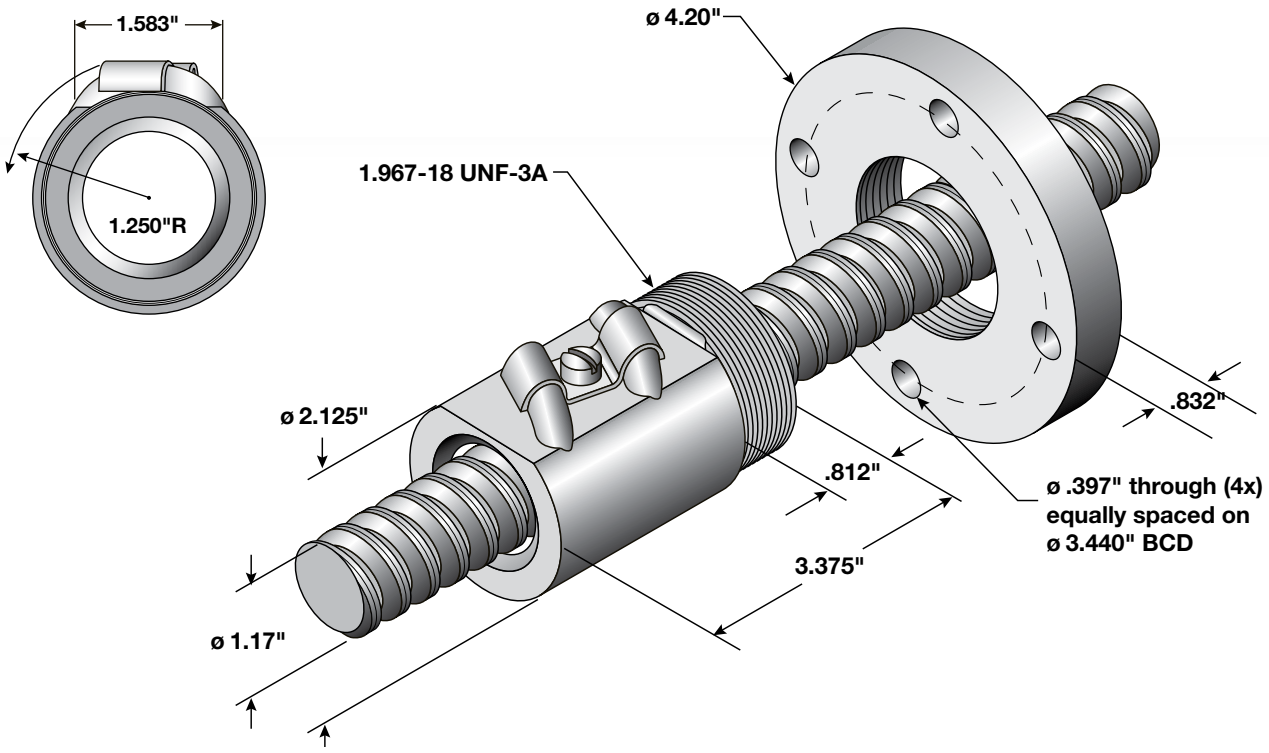
*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

Please contact our customer service department for assistance.

1.17 x .413 Inch - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 1.17 x .413 Inch Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
117BSA041	1.171	.413	.413	1	.870	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
117BNH041	22,917	3,894	1058.00	2.421	+90%	0.073	Steel	1.967-18 UNF-3A	.812	3.375	2.125
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1967	4.20	3.44	.397	4	.832	Black Oxide	Steel	1.967-18 UNF-3B	2	1.583	1.250

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

*Load ratings are based on what the screw & nut assembly is capable of achieving. Actual load performance for a given screw and nut assembly will vary from application to application.

*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

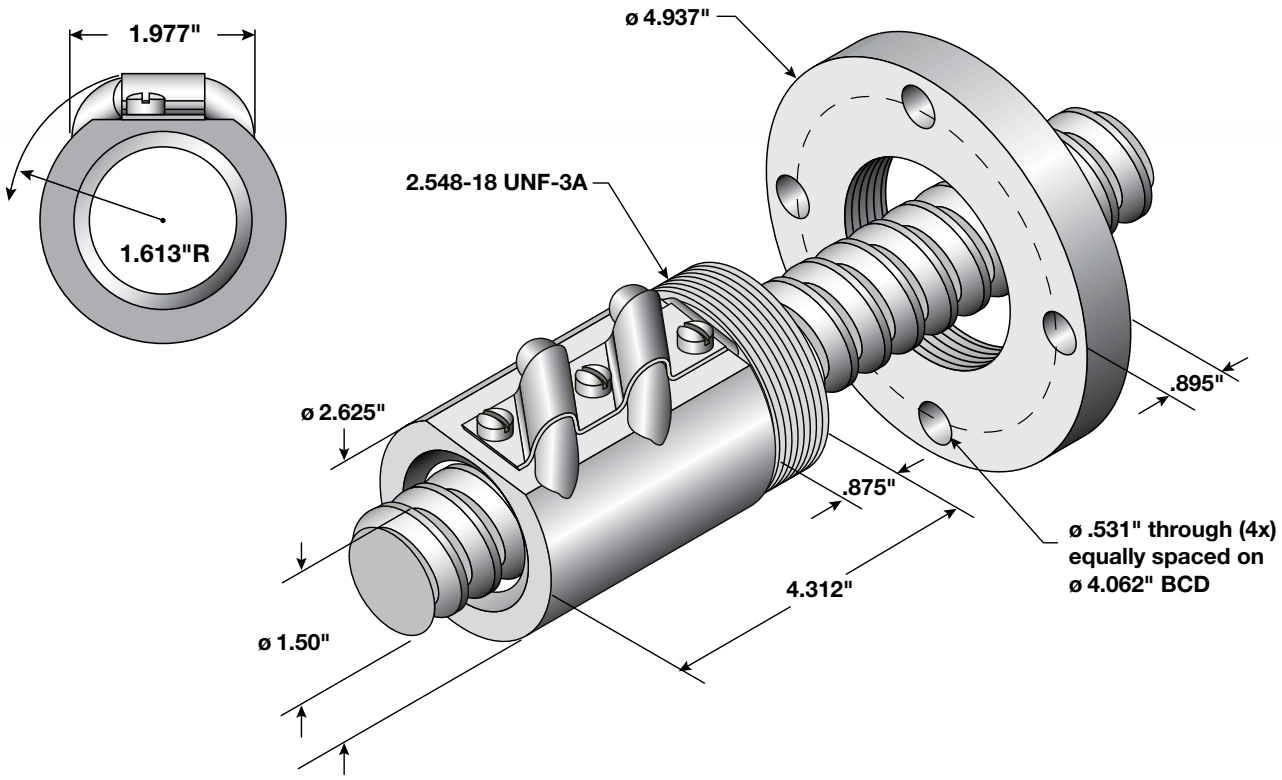
Please contact our customer service department for assistance.

BALL SCREWS & NUTS

1-1/2 x .473 Inch (1.50 x .473 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 1-1/2 x .473 Inch (1.5 x .473 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
150BSA047	1.500	.473	.473	1	1.140	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
150BNH047	57,770	10,050	946.00	2.114	+90%	0.084	Steel	2.548-18 UNF-3A	.875	4.312	2.625
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL2548	4.94	4.062	.531	4	.895	Black Oxide	Steel	2.548-18 UNF-3B	2	1.977	1.613

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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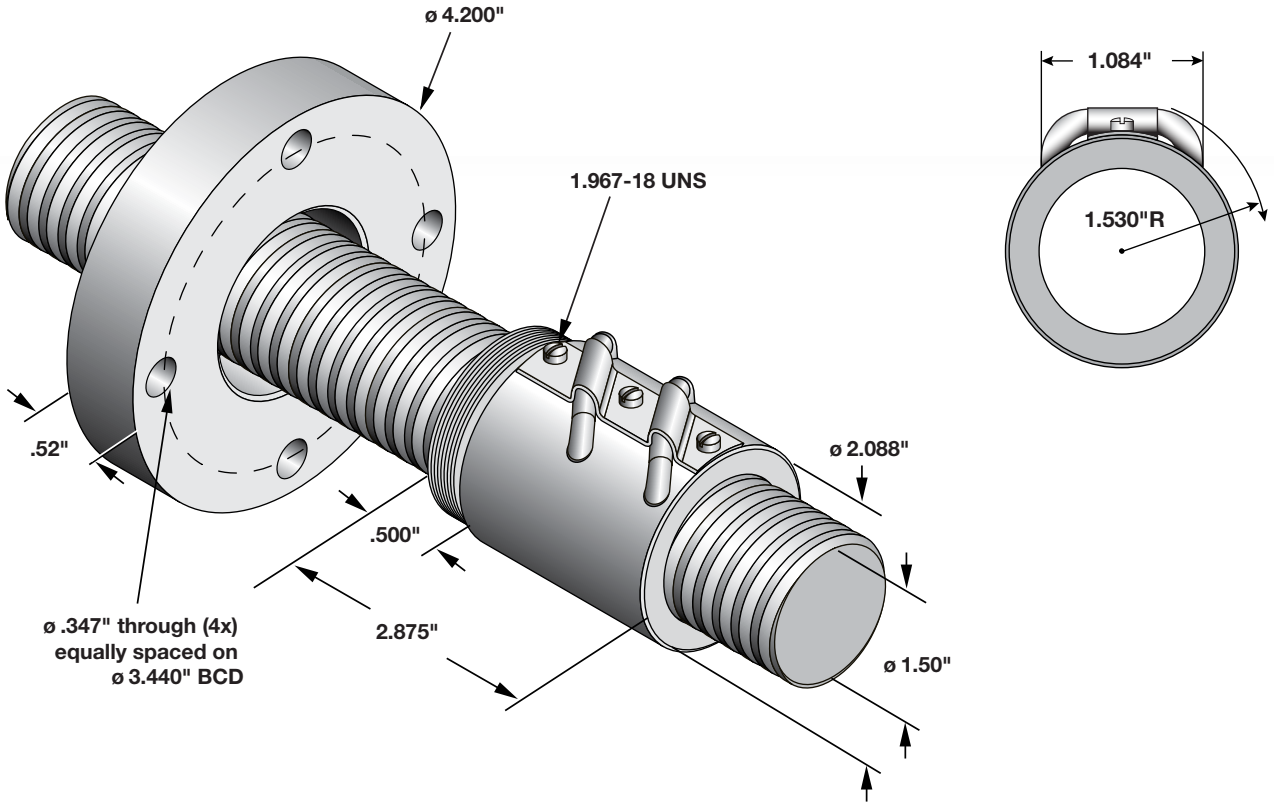
*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

Please contact our customer service department for assistance.

1-1/2 x .250 Inch (1.50 x .250 Inch) - Left Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 1-1/2 x .250 Inch (1.50 x .250 Inch) Diameter - Left Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
150BSA025L	1.500	.250	.250	1	1.32	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
150BNH025L	44,030	4,198	500.00	4	+90%	0.044	Steel	1.967-18 UNF-3A	.500	2.875	2.088
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1967	4.20	3.44	.397	4	.832	Black Oxide	Steel	1.967-18 UNF-3B	2	1.604	1.342

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

*Load ratings are based on what the screw & nut assembly is capable of achieving. Actual load performance for a given screw and nut assembly will vary from application to application.

*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

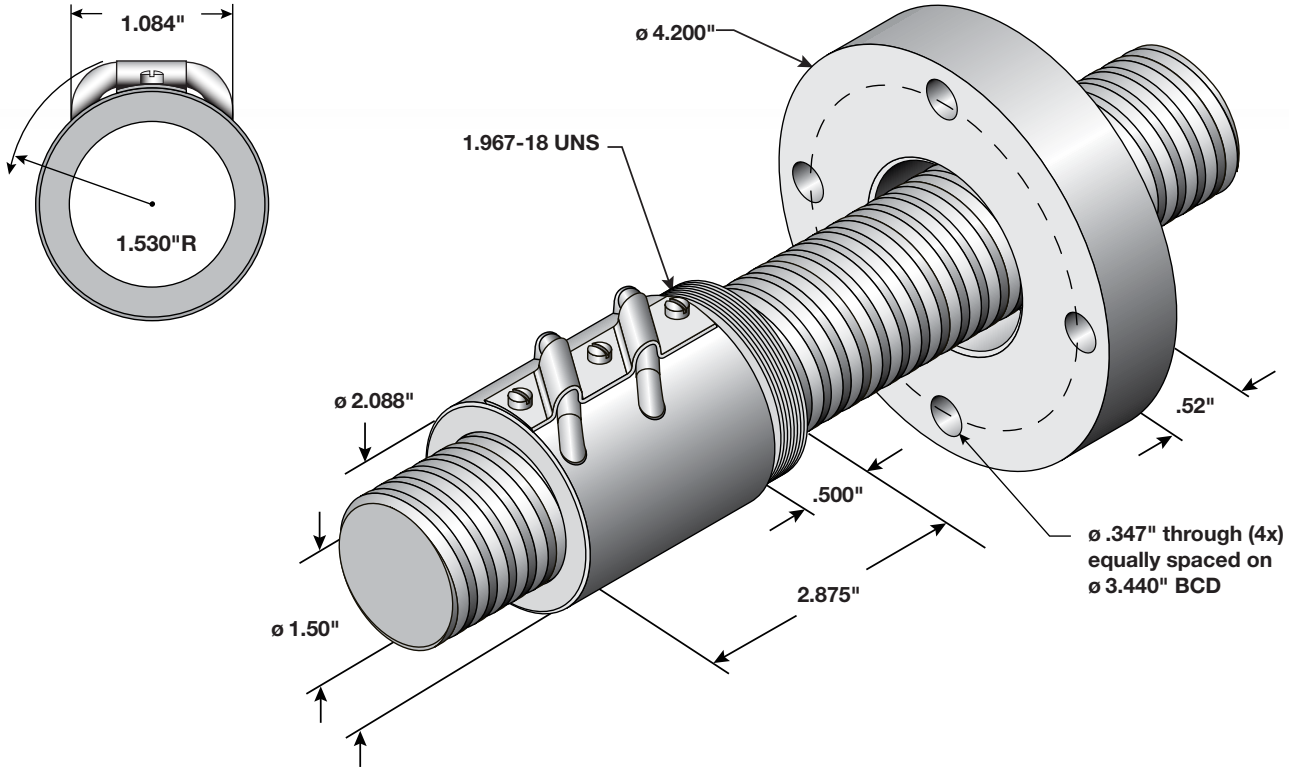
Please contact our customer service department for assistance.

BALL SCREWS & NUTS

1-1/2 x .250 Inch (1.50 x .250 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 1-1/2 x .250 Inch (1.50 x .250 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
150BSA025	1.500	.250	.250	1	1.32	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
150BNH025	44,030	4,198	500.00	4	+90%	0.044	Steel	1.967-18 UNF-3A	.500	2.875	2.088
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL1967	4.20	3.44	.397	4	.832	Black Oxide	Steel	1.967-18 UNF-3B	2	1.604	1.342

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

*Load ratings are based on what the screw & nut assembly is capable of achieving. Actual load performance for a given screw and nut assembly will vary from application to application.

*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

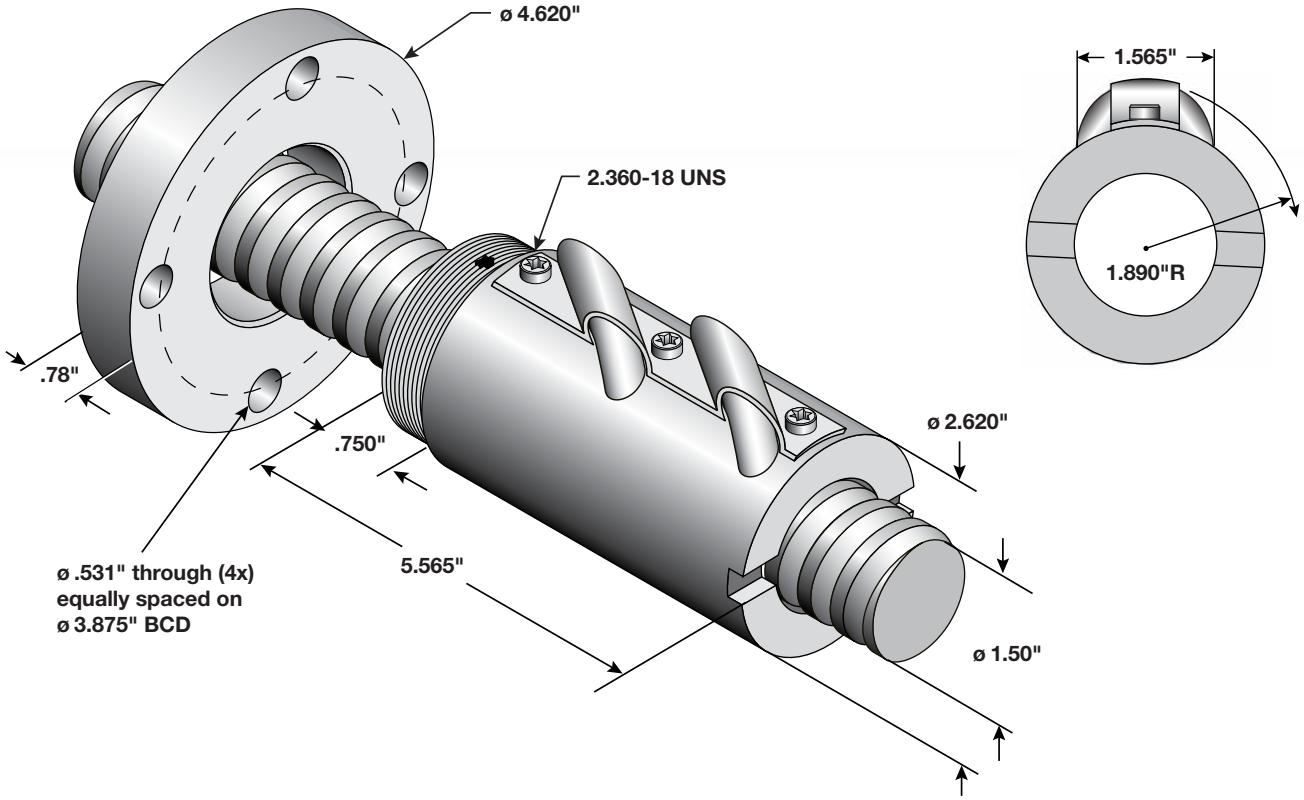
Please contact our customer service department for assistance.

BALL SCREWS & NUTS

1-1/2 x .500 Inch (1.50 x .500 Inch) - Left Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 1-1/2 x .500 Inch (1.50 x .500 Inch) Diameter - Left Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
150BSA050L	1.500	.500	.500	1	1.270	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
150BNH050L	102,300	14,513	1000.00	2	+90%	0.089	Steel	2.360-18 UNS	.750	5.565	2.620
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL2360L	4.620	3.875	.531	4	.780	Black Oxide	Steel	2.360-18 UNS	2	1.565	1.890

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

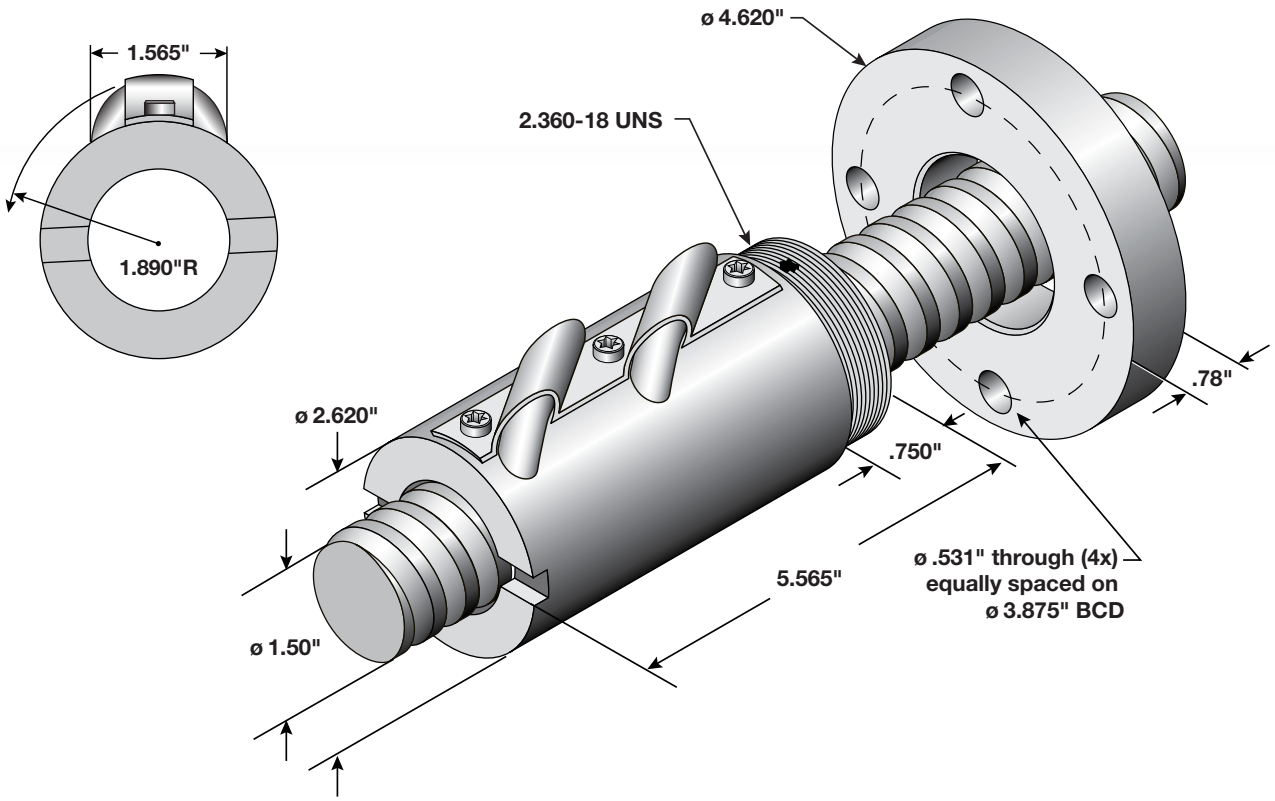
Please contact our customer service department for assistance.

BALL SCREWS & NUTS

1-1/2 x .500 Inch (1.50 x .500 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 1-1/2 x .500 Inch (1.50 x .500 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
150BSA050	1.500	.500	.500	1	1.270	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
150BNH050	102,300	14,513	1000.00	2	+90%	0.089	Steel	2.360-18 UNS	.750	5.565	2.620
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL2360	4.620	3.875	.531	4	.780	Black Oxide	Steel	2.360-18 UNS	2	1.565	1.890

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

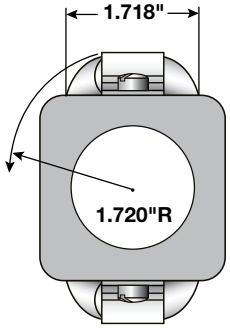
Please contact our customer service department for assistance.

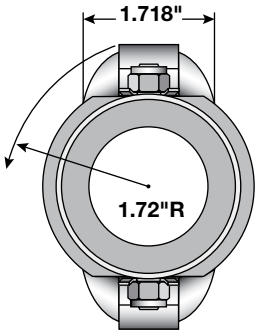
BALL SCREWS & NUTS

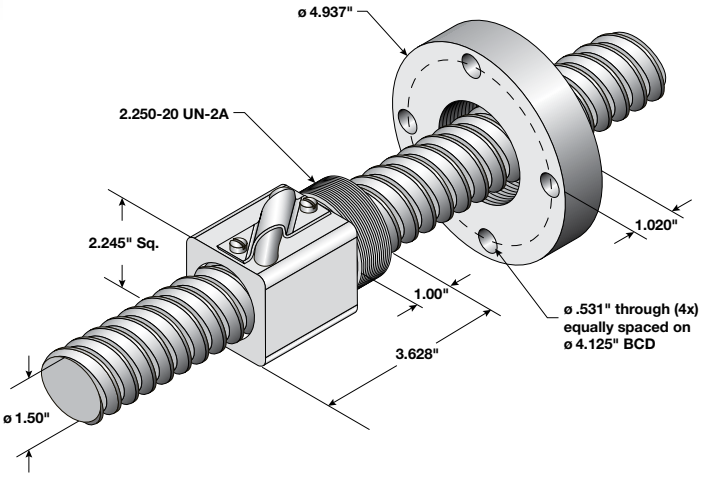
1-1/2 x 1.00 Inch (1.50 x 1.00 Inch) - Right Hand

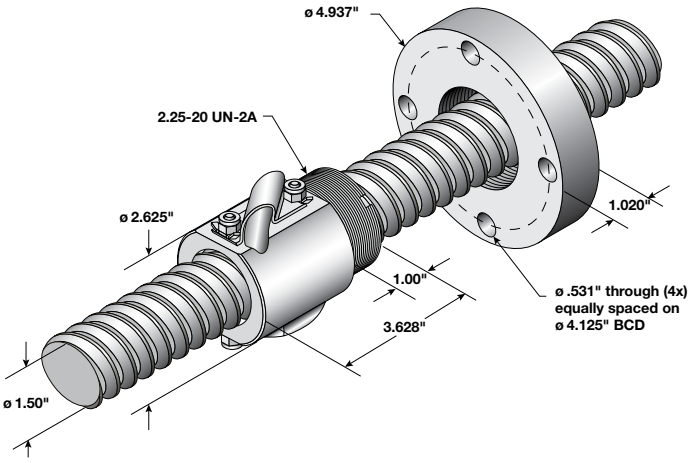
Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96









Ball Screw & Nut 1-1/2 x 1.00 (1.50 x 1.00 Inch) Diameter - Right Hand

Ball Screw and Square Ball Nut

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
150BSA100	1.500	1.000	.500	2	1.140	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
150BNF100	34,662	8,250	2000.00	1	+90%	0.176	Steel	2.250-20 UN-2A	1.00	3.628	2.245 Sq.
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL2250	4.94	4.125	.531	4	1.020	Black Oxide	Steel	1.250-20 UN-2B	2	1.718	1.720

Ball Screw and Round Ball Nut

Ball Nut	*Static Load	*Dynamic Load	*Max. Speed	T.P.I.	Efficiency	Torque to Raise 1 Lb.	Material	Mounting Thread	Mounting Length	Nut Length	Nut Diameter
150BNH100	34,662	8,250	2000.00	1	+90%	0.176	Steel	2.250-20 UN-2A	1.00	3.633	2.627
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL2250	4.94	4.125	.531	4	1.020	Black Oxide	Steel	2.250-20 UN-2B	2	1.718	1.720

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

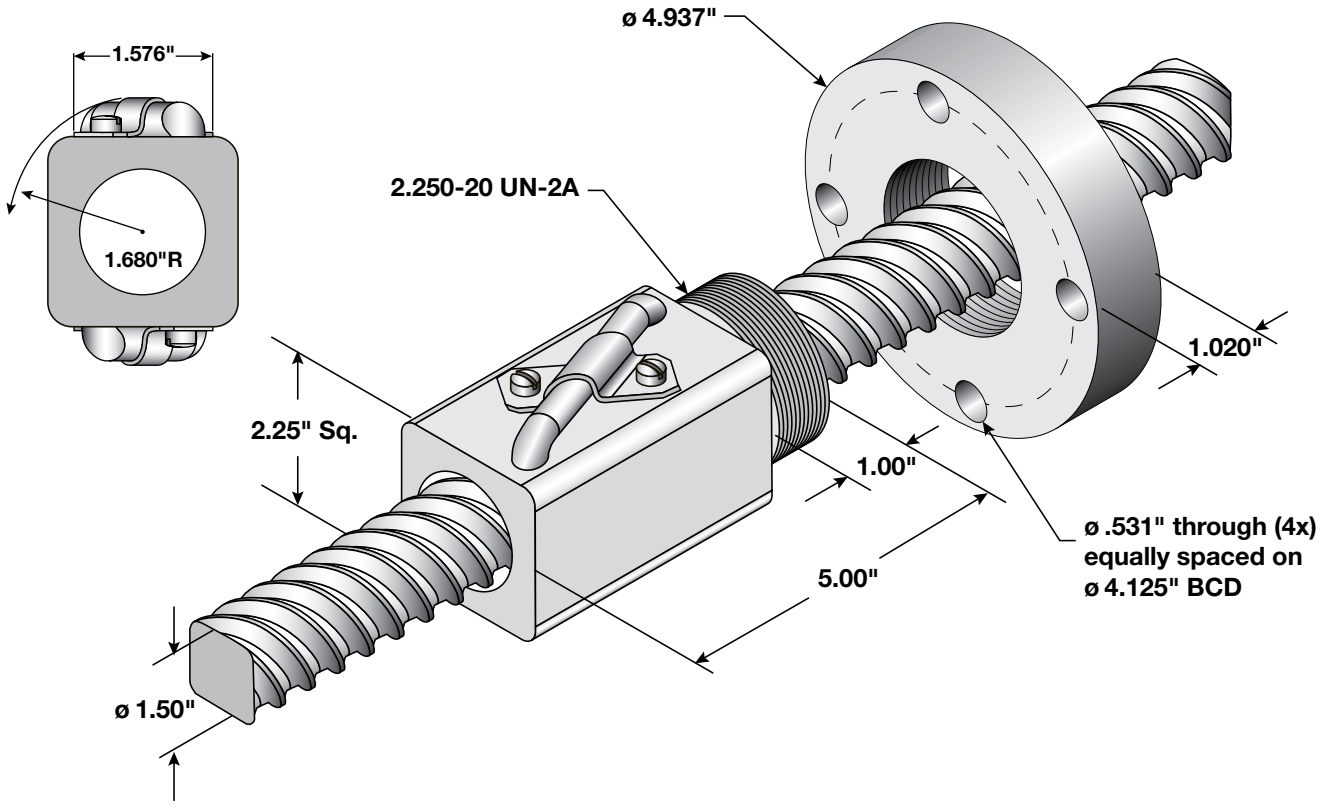
Please contact our customer service department for assistance.

BALL SCREWS & NUTS

1-1/2 x 1.875 Inch (1.50 x 1.875 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 1-1/2 x 1.875 (1.50 x 1.875 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
150BSA187	1.500	1.875	.468	4	1.190	Ball	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
150BNF187	29895	7242	3750.00	0.53	+90%	0.332	Steel	2.250-20 UN-2A	1.00	5.000	2.245 Sq.
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL2250	4.94	4.125	.531	4	1.020	Black Oxide	Steel	1.250-20 UN-2B	2	1.567	1.680

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

*Load ratings are based on what the screw & nut assembly is capable of achieving. Actual load performance for a given screw and nut assembly will vary from application to application.

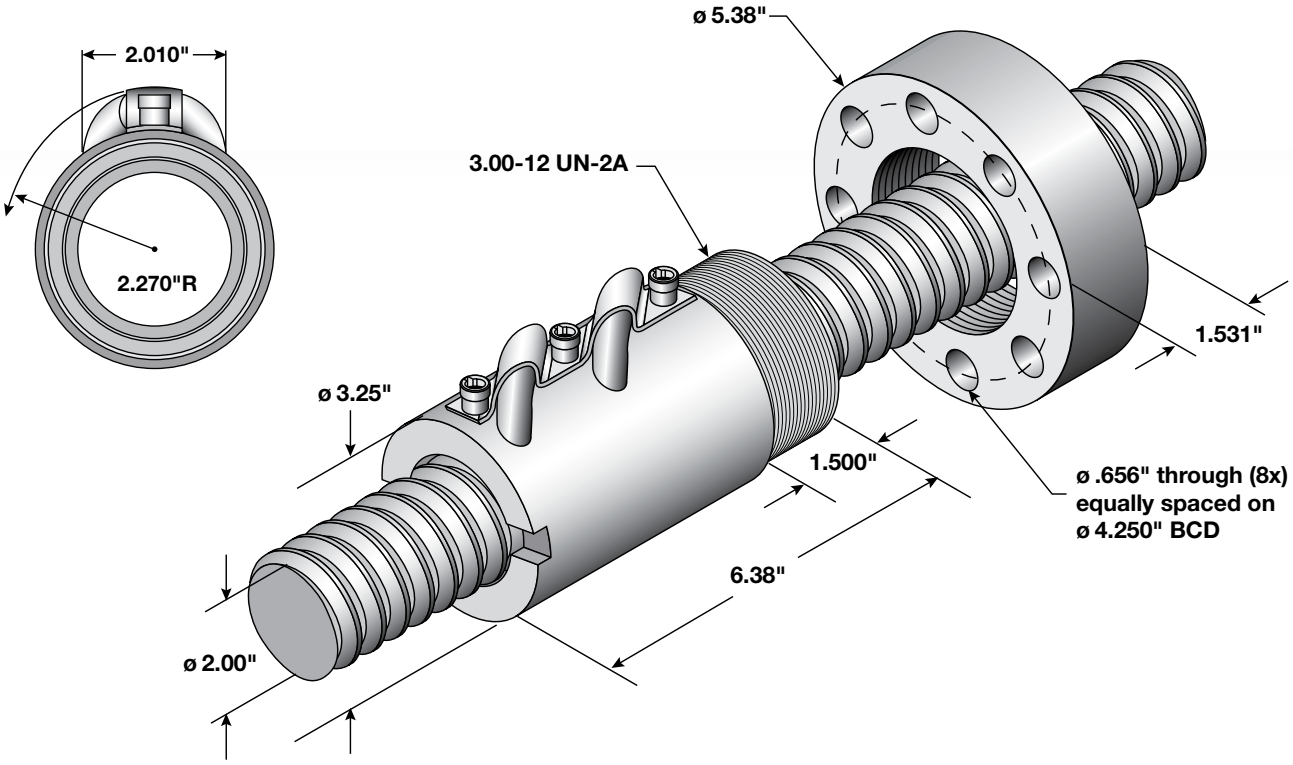
*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

Please contact our customer service department for assistance.

2 x .500 Inch (2.00 x .500 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 2 x .500 (2.00 x .500 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
200BSA050	2.000	.500	.500	1	1.720	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
200BNH050	143,400	18,500	750.00	2	+90%	0.088	Steel	3.00-12 UN-2A	1.500	6.380	3.250
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL3000	5.38	4.250	.656	8	1.531	Black Oxide	Steel	3.00-12 UN-2B	2	2.010	2.270

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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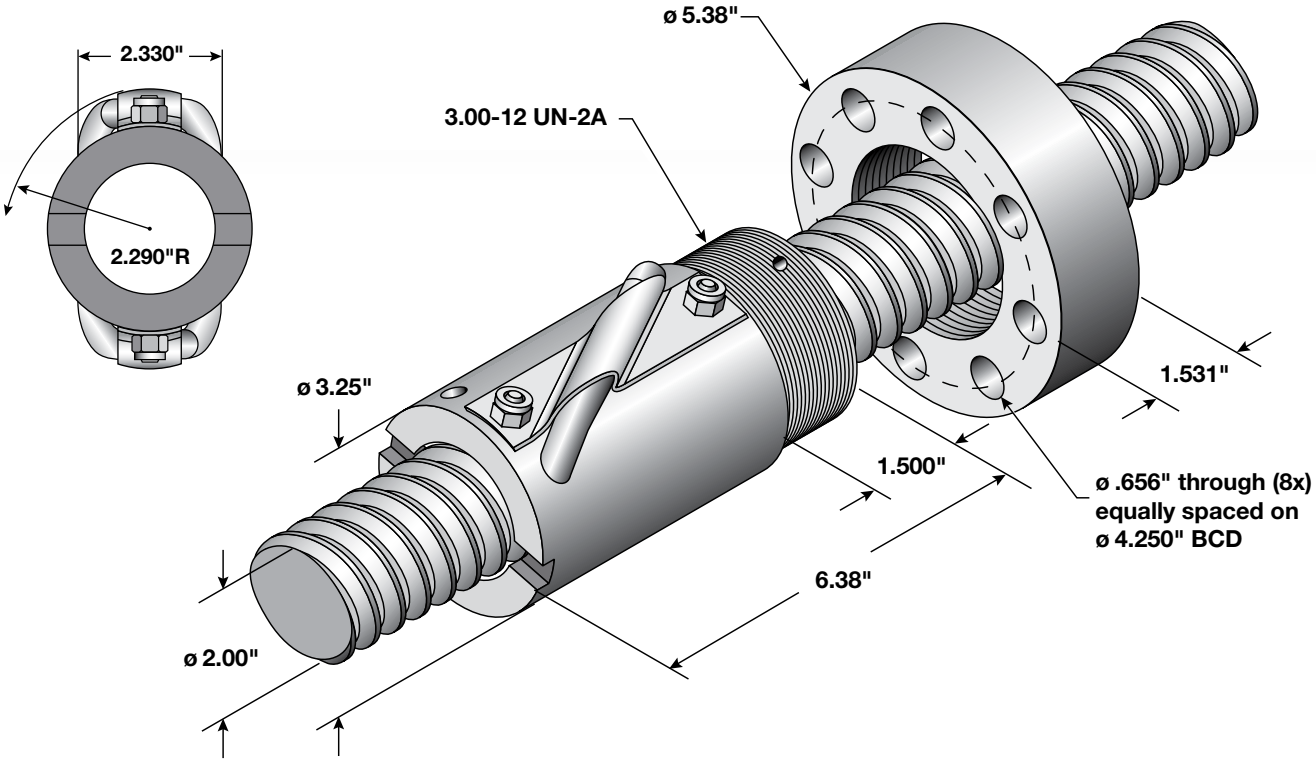
Please contact our customer service department for assistance.

BALL SCREWS & NUTS

2 x 1.00 Inch (2.00 x 1.00 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 2 x 1.00 (2.00 x 1.00 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
200BSA100	2.000	1.000	.500	2	1.720	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
200BNH100	134500	21200	1500.00	2	+90%	0.176	Steel	3.00-12 UN-2A	1.500	6.380	3.250
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL3000	5.38	4.250	.656	8	1.531	Black Oxide	Steel	3.00-12 UN-2B	2	2.330	2.290

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

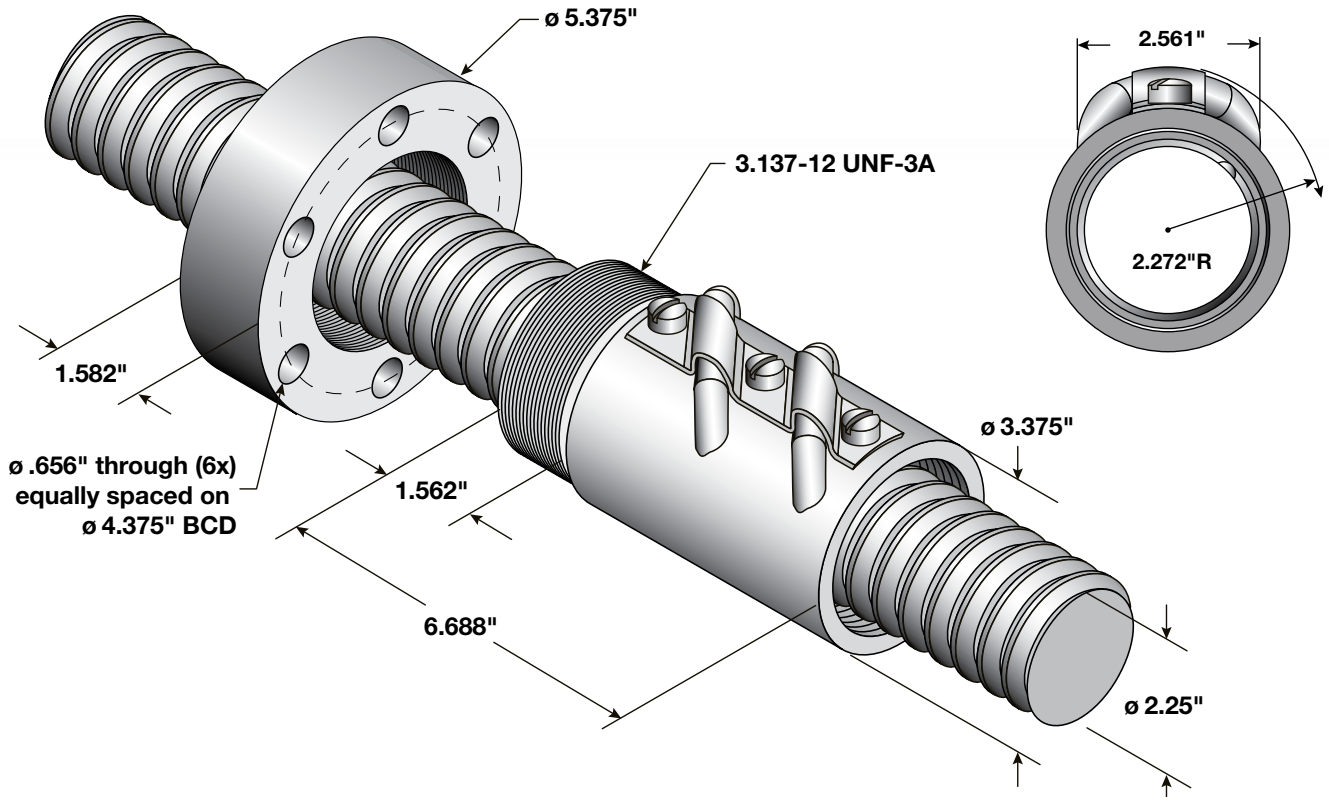
Please contact our customer service department for assistance.

BALL SCREWS & NUTS

2-1/4 x .500 Inch (2.25 x .500 Inch) - Left Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 2-1/4 x .500 (2.25 x .500 Inch) Diameter - Left Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
225BSA050L	2.250	.500	.500	1	1.850	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
225BNH050L	161,150	21,306	667.00	2	+90%	0.088	Alloy	3.137-12 UNF-3A	1.562	6.688	3.375
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL3137	5.375	4.375	.656	8	1.582	Black Oxide	Steel	3.137-12 UNF-3B	2	2.561	2.272

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

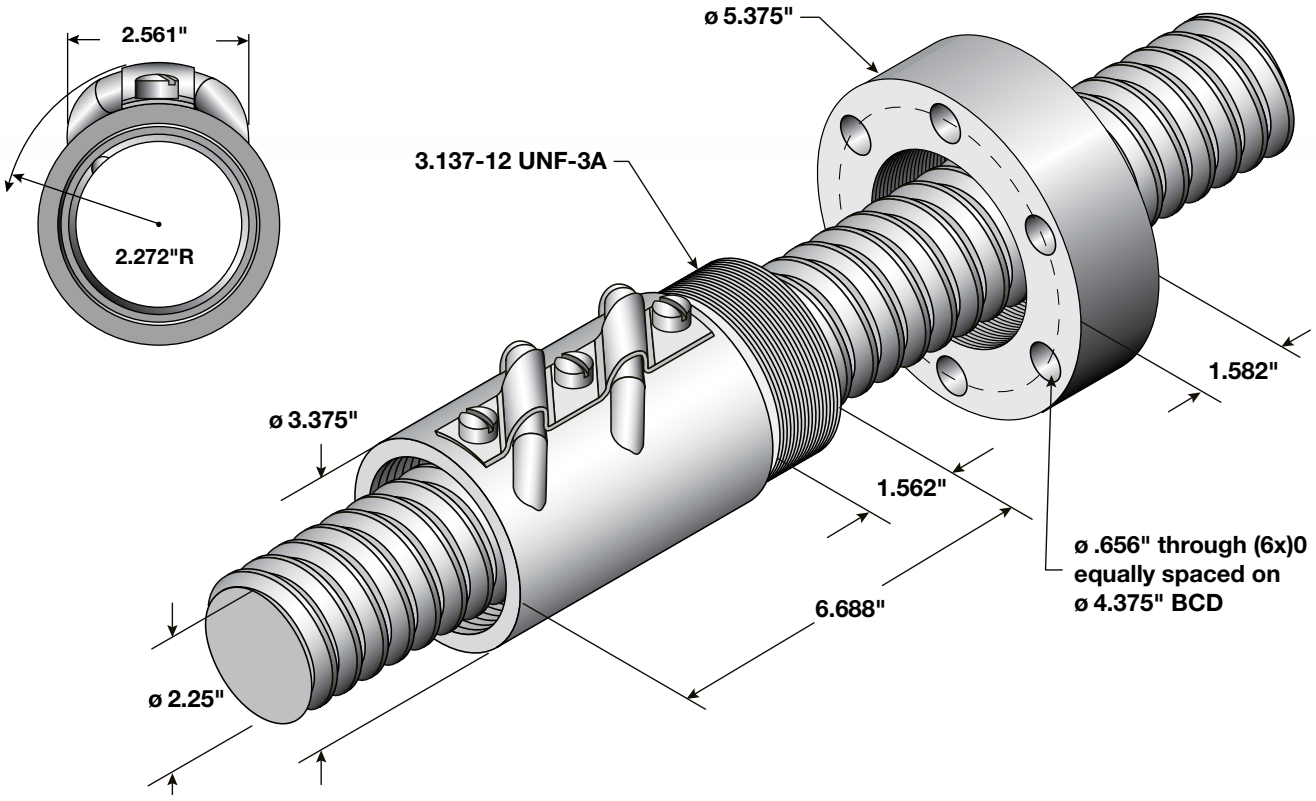
Please contact our customer service department for assistance.

BALL SCREWS & NUTS

2-1/4 x .500 Inch (2.25 x .500 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 2-1/4 x .500 (2.25 x .500 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
225BSA050	2.250	.500	.500	1	1.850	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
225BNH050	161,150	21,306	667.00	2	+90%	0.088	Alloy	3.137-12 UNF-3A	1.562	6.688	3.375
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL3137	5.375	4.375	.656	6	1.582	Black Oxide	Steel	3.137-12 UNF-3B	2	2.561	2.272

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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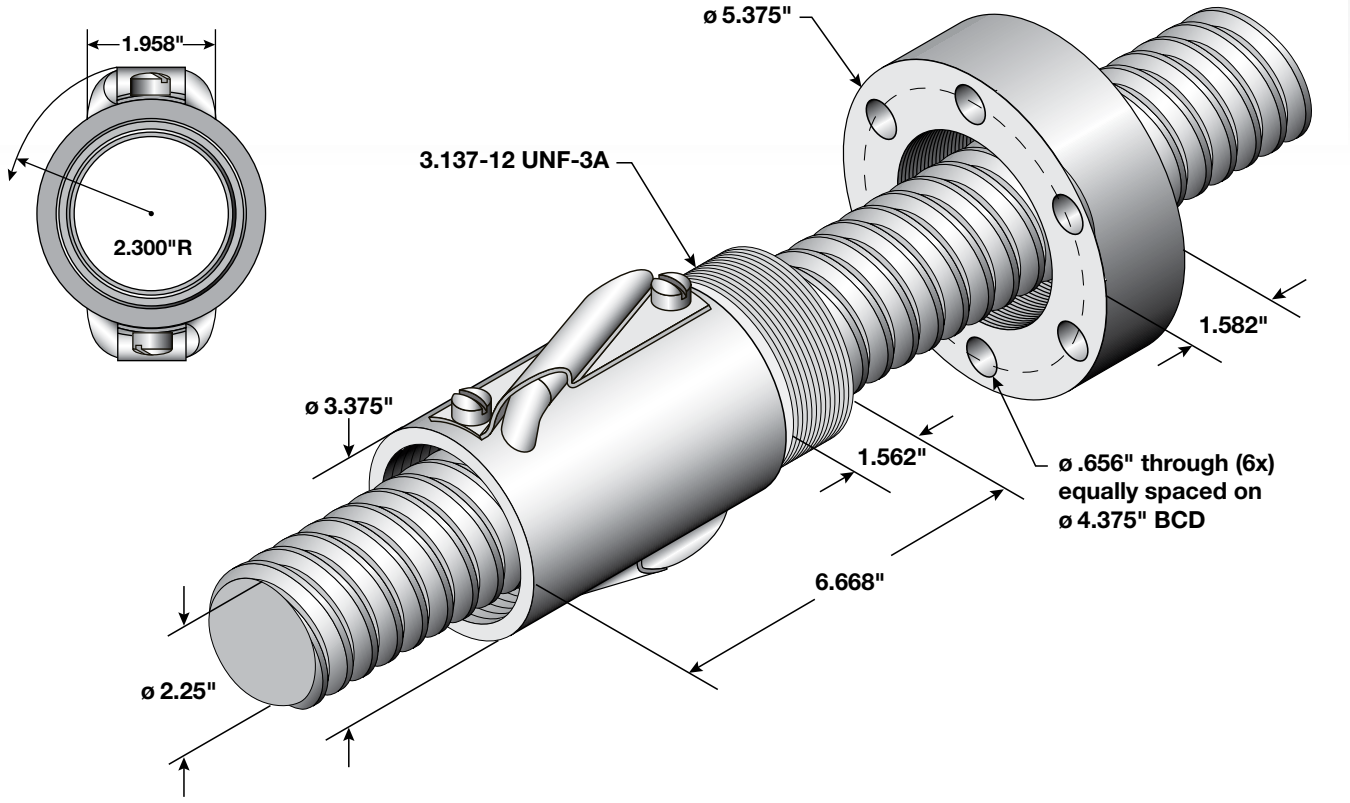
*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

Please contact our customer service department for assistance.

2-1/4 x 1.00 Inch (2.25 x 1.00 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 2-1/4 x 1.00 (2.25 x 1.00 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
225BSA100	2.250	1.000	.500	2	1.850	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
225BNH100	161,150	26538	1333.00	2	+90%	0.176	Steel	3.137-12 UNF-3A	1.562	6.688	3.375
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL3137	5.375	4.375	.656	6	1.582	Black Oxide	Steel	3.137-12 UNF-3B	2	1.958	2.300

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

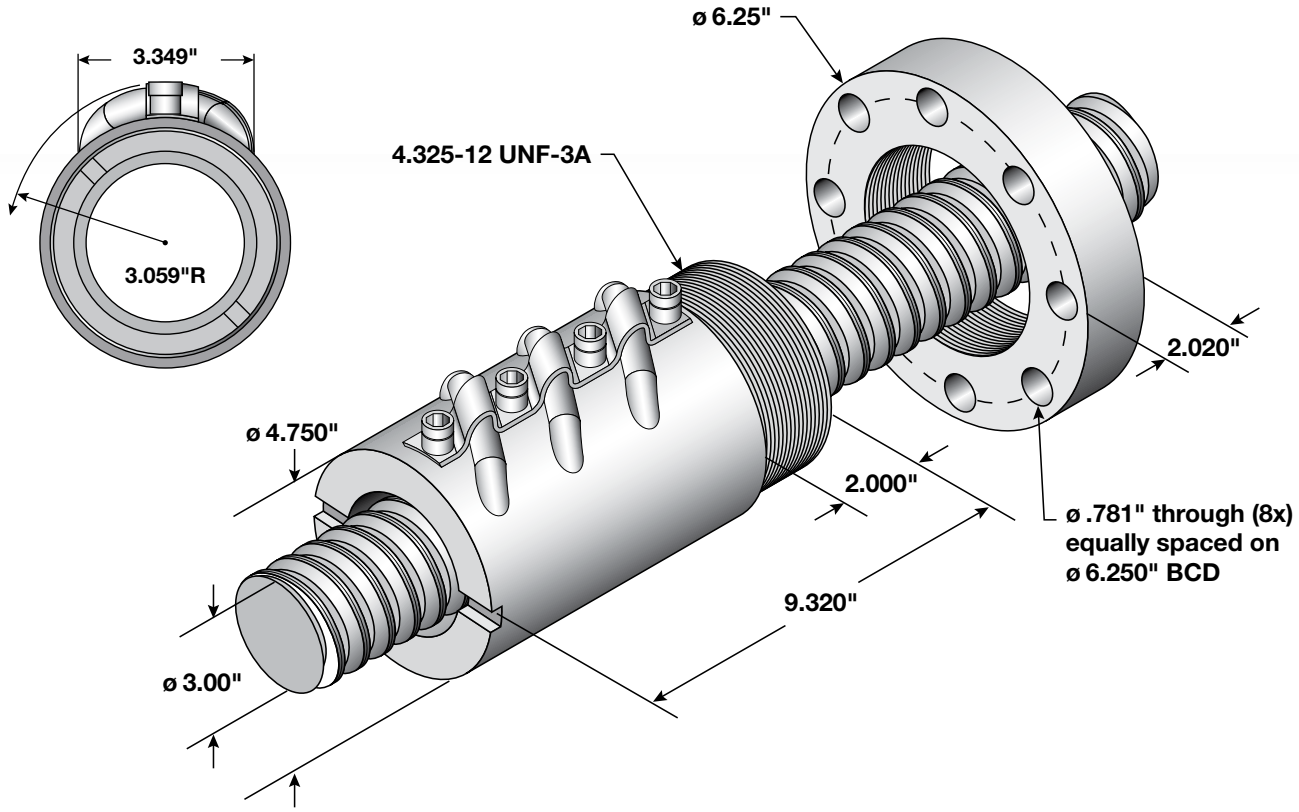
Please contact our customer service department for assistance.

BALL SCREWS & NUTS

3 x .660 Inch (3.00 x .660 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 3 x .660 (3.00 x .660 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
300BSA066	3.000	.660	.660	1	2.480	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
300BNJ066	323,950	44,316	660.00	1.515	+90%	0.116	Alloy	4.325-12 UNF-3A	2.000	9.320	4.750
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL4325	7.375	6.250	.781	8	2.020	Black Oxide	Steel	4.325-12 UNF-3B	3	3.356	3.340

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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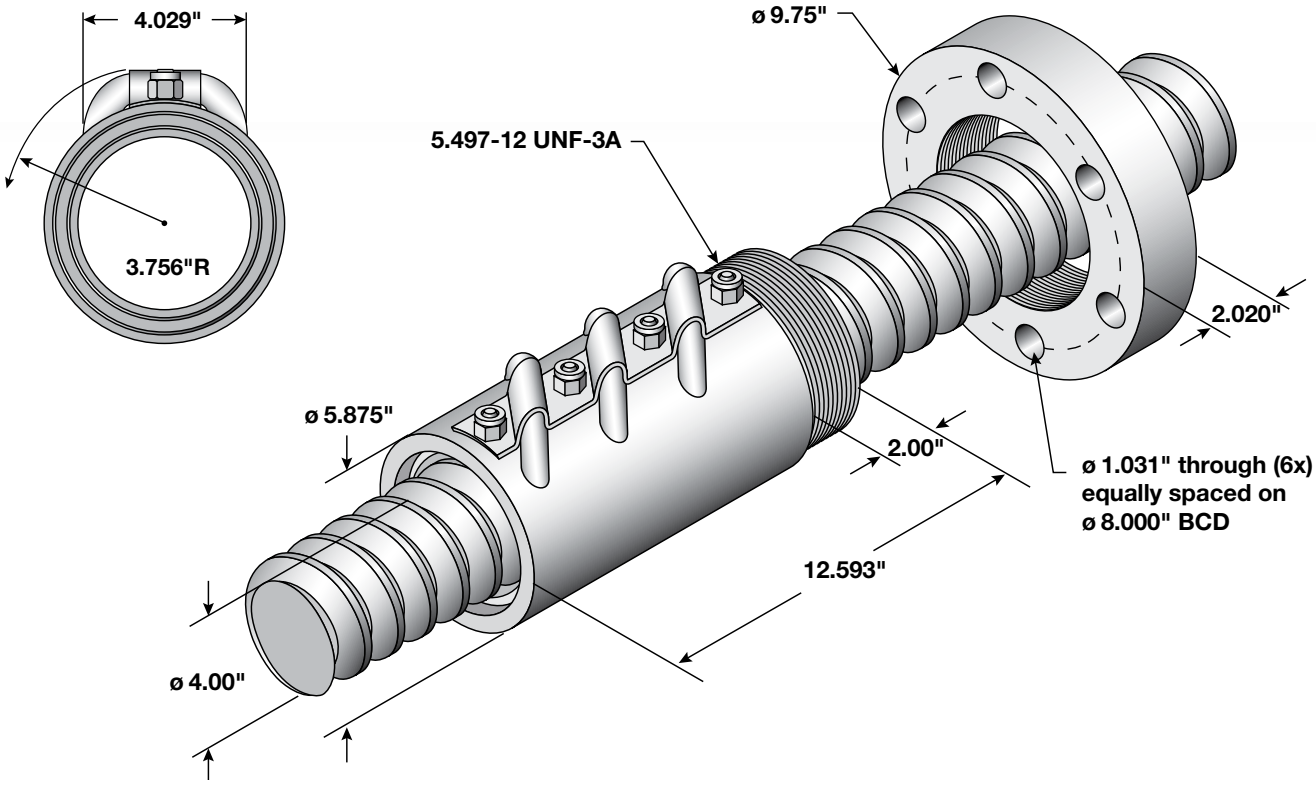
*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

Please contact our customer service department for assistance.

4 x 1.00 Inch (4.00 x 1.00 Inch) - Right Hand

Duff-Norton offers complete close mounted systems to complement these screw & nut assemblies as follows:

- Screw Journal Ends - Page 64
- End Blocks - Page 66
- Motor Flanges - Page 70
- Gearmotors - Page 76
- Controls - Page 96



Ball Screw & Nut 4 x 1.00 (4.00 x 1.00 Inch) Diameter - Right Hand

Ball Screw	Screw Dia.	Lead	Pitch	No. Starts	Root Dia.	Thread Form	Material	Maximum Backlash	Standard Lengths		
									36 Inch	72 Inch	144 Inch
400BSA100	4.000	1.000	1.000	1	3.340	Ball RH	Alloy	.002 to .015	Yes	Yes	Yes
Ball Nut	***Static Load**	***Dynamic Load**	***Max. Speed**	**T.P.I.**	**Efficiency**	**Torque to Raise 1 Lb.**	**Material**	**Mounting Thread**	**Mounting Length**	**Nut Length**	**Nut Diameter**
400BNJ100	476,970	85,758	750.00	1	+90%	0.176	Alloy	5.497-12 UNF-3A	1.995	12.593	5.875
Flange	**Overall Dia.**	**Bolt Cir. Dia.**	**Bolt Hole Dia.**	**Mounting Holes**	**Flange Width**	**Treated**	**Material**	**Mounting Thread**			
FL5497	9.75	8.000	1.031	6	2.020	Black Oxide	Steel	5.497-12 UNF-3B	3	4.029	3.756

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in Inches per Minute.

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*Speed ratings are based on a DN spec of 3000, actual speeds will vary from application to application.

Please contact our customer service department for assistance.

BALL SCREWS & NUTS
MODEL NUMBERING SYSTEM

B 103 (L) A - 30 - 1373R07M1 / HW06 - EX

Example Explanation:
Ball Screw
1'' Diameter, 0.250'' Lead
Nut & Flange Assy
Threaded Length: 30
0.37kW-3ph IEC 71B14 Brake Motor with a 7.1~8.0 :1 reducer in Position 1
Hand Wheel 6" diameter
End Block Include
No additional options

Thread Form
B = Ball Screw

Thread Form Codes

CODE	DIA	LEAD
052	1/2''	0.200
055	1/2''	0.500
062	5/8"	0.200
060	5/8"	1.000
072	3/4''	0.200
075	3/4''	0.500
103	1''	0.250
105	1''	0.500
110	1''	1.000
114	1.17''	0.413
152	1 1/2''	0.250
154	1 1/2''	0.473
155	1 1/2''	0.500
150	1 1/2''	1.000
158	1 1/2''	1.875
205	2''	0.500
210	2''	1.000
225	2 1/4''	0.500
220	2 1/4''	1.000
306	3''	0.666
410	4''	1.000

Left hand thread screws
L

Nut-Flange Opt.
A = Nut without flange
B = Nut with flange assembled
C = Nut with flange, Unassembled

Overall length
00.00 (Type in)

ADDITIONAL OPTIONS
Nut Material
E = End Block Include

Nut Tyoe
D = Double Return Tube Ball Nut
Q = Square Ball Nut

X = Standard (no additional options)
S = Additional Specification Required.

DRIVE END

CODE	SHAFT EXTEN.
X	No Ends
3A	Fixed Journal Ends
1A	Simple Journal Ends
1B	Simple Journal Ends no Drive
3A	Fixed Journal Ends
HW	Hand Wheel
HWC	Hand Wheel & Counter
	Motor
	Reducer

CONTROL END

CODE	SHAFT EXTEN.
X	No Ends
1A	Simple Journal Ends
1B	Simple Journal Ends no Drive
3A	Fixed Journal Ends
3B	Fixed Journal Ends no Drive
HW	Hand Wheel
HWC	Hand Wheel & Counter
	Counter
	Limit Switch

Motor Flange (Without Motor)
NEMA Frame
56C = 56C Frame
14C = 143C Frame
18C = 182C Frame
21C = 213C Frame
IEC Frame
6B4 = IEC 63 B14
7B5 = IEC 71 B5
7B4 = IEC 71 B14
8B5 = IEC 80 B5
8B4 = IEC 80 B14
9B5 = IEC 90 B5
9B4 = IEC 90 B14
10B4 = IEC 100 B14
11B4 = IEC 112 B14

Reducer
(Position M1 through M6)
R02 = 2.0~3.0 :1 Reduction
R03 = 3.1~4.0 :1 Reduction
R04 = 4.1~5.0 :1 Reduction
R05 = 5.1~6.0 :1 Reduction
R06 = 6.1~7.0 :1 Reduction
R07 = 7.1~8.0 :1 Reduction
R10 = 10.0~14.9:1 Reduction
R15 = 15.0~19.9:1 Reduction
R20 = 20.0~29.9:1 Reduction
R30 = 30.0~39.9:1 Reduction
R40 = 40.0~49.9:1 Reduction
R50 = 50.0~59.9:1 Reduction

NEMA Frame

Motor With Brake		Motor Without Brake	
Three Phase	Single Phase	Three Phase	Single Phase
N023=1/4 HP	N021=1/4 HP	N024=1/4 HP	N022=1/4 HP
N033=1/3 HP	N031=1/3 HP	N034=1/3 HP	N032=1/3 HP
N053=1/2 HP	N051=1/2 HP	N054=1/2 HP	N052=1/2 HP
N073=3/4 HP	N071=3/4 HP	N074=3/4 HP	N072=3/4 HP
N013= 1 HP	N011= 1 HP	N014= 1 HP	N012= 1 HP
N153=1 1/2 HP	N151=1 1/2 HP	N154=1 1/2 HP	N152=1 1/2 HP
N203=2 HP		N204=2 HP	
N303=3 HP		N304=3 HP	
N503=5 HP		N404=4 HP	
N753=7 1/2 HP		N754=7 1/2 HP	
N103=10 HP		N104=10 HP	

IEC Frame

Motor With Brake		Motor Without Brake	
Three Phase	Single Phase	Three Phase	Single Phase
I183=0.18kW	I181=0.18kW	I184=0.18kW	I182=0.18kW
I253=0.25kW	I251=0.25kW	I254=0.25kW	I252=0.25kW
I373=0.37kW	I371=0.37kW	I374=0.37kW	I372=0.37kW
I553=0.55kW	I551=0.55kW	I554=0.55kW	I552=0.55kW
I753=0.75kW	I751=0.75kW	I754=0.75kW	I752=0.75kW
I113=1.10kW	I111=1.10kW	I114=1.10kW	I112=1.10kW
I153=1.50kW		I154=1.50kW	
I223=2.20kW		I224=2.20kW	
I303=3.00kW		I304=3.00kW	
I403=4.00kW		I404=4.00kW	

EXAMPLE:
56CR04M2 = 56C NEMA Motor Mounts with a 2.0~3.0:1 reducer, position 2
I373R07M1 = 0.37kW-3ph IEC 71B14 Brake Motor with a 7.1~8.0 :1 reducer in Position 1

Hand Wheels
HW Hand Wheel
HWC Hand Wheel & Counter
04 = ϕ 4''
06 = ϕ 6''
08 = ϕ 8''
10 = ϕ 10''
12 = ϕ 12''

Counter
C01 = Reads 1 Per Turn
C02 = Reads 0.5 Per Turn
C04 = Reads 0.25 Per Turn
C05 = Reads 0.2 Per Turn
C10 = Reads 0.1 Per Turn

EXAMPLE:
HWC05 = Hand Wheel & Counter Reads

Limit Switch
LE1 = EBLS600-1
LE2 = EBLS600-2
LA1 = SKA6000AT10
LA2 = SKA6000AT20
LN1 = NZ6000-1
LN2 = NZ6000-2
LB1 = SKA6000BT10
LB2 = SKA6000BT20

JOURNALS & END BLOCKS

Screw Journals

Duff-Norton offers the traditional style Type 1 & 3 journal end screws with and without keyed drive ends. These traditional styled journals coordinate well with the Duff-Norton End Blocks and can be delivered quickly.

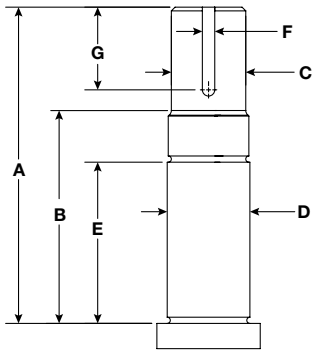
Additionally, Duff-Norton does have the machining capability to provide custom journal ends.

FEATURES & BENEFITS

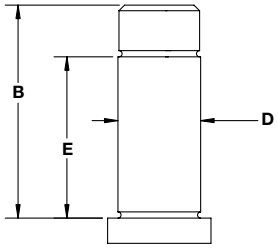
Journal End Features

- Common Type 1 and 3 journal ends for Acme or Ball Screws
- Close bearing journal tolerances, for simple bearing installation
- Specialty journals integrate with Duff-Norton Drive and Control components
- Integrate with standard self-locking lock nuts
- Custom journals available for many applications

Fixed Journal Ends

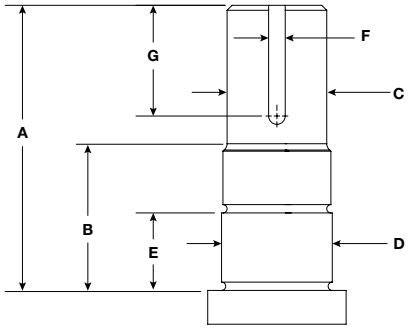


Type 3A - with Drive End

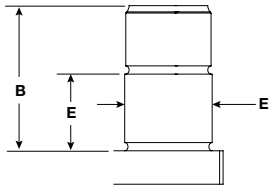


Type 3B - without Drive End

Simple Journal Ends



Type 1A - with Drive End



Type 1B - without Drive End

www.duffnorton.com
Ph: (800) 477-5002 • Fax: (704) 588-1994

Journals & End Blocks Dimensions - Simple and Fixed

Fixed Journal Ends

Acme Screw & Lead	Ball Screw & Lead	Type 1A, Type 1B - Fixed Ends					Motor Flange Fixed "A"	Common Dimensions				
		A	B	E	End Block #	Bearing Number		C	D**	F	G	Lock Nut #
1/2 - All*	1/2 - All*	2.90	1.62	1.26	EB000F	7200	Special	0.313	0.3936	1/8	1.25	BN-00
0.63 - All*, 3/4 - All*	0.63 - All*	3.29	2.00	1.56	EB001F	7301		0.406	0.4723			BN-01
1 - All*	3/4 - All*	3.65	2.38	1.84	EB003F	7303		0.562	0.6692			BN-03
1 x .100	1, 1.17 - All*	4.03	2.73	2.14	EB004F	7304		0.625	0.7873	3/16		BN-04
1-1/2 x .375	1-1/2 x .047, 1-1/2 x 1.00	4.45	2.93	2.29	EB005F	7305		0.875	0.9842			BN-05
1-1/2 - All*, 2 x .500	1-1/2 x .250, 1-1/2 x .500, 1-1/2 x 1.875	4.86	3.05	2.42	EB006F	7306		1.00	0.1810	1/4		BN-06
2 x .500, 2-1/4 x .500	2 - All*	6.37	4.13	3.50	EB008S	7308		1.375	1.5747	5/16	1.88	BN-08
2-1/4 x .250	2-1/4 - All*	6.68	4.60	3.87	EB009S	7309			1.7716			BN-09
2-1/2 - All*	—	7.75	4.75	4.04	EB010S	7310		1.75	1.9684	3/8	2.75	BN-10
3 - All*	3 - All*	9.22	5.65	4.86	EB012S	7312		2.25	2.3621	1/2	3.38	BN-12
3-3/4, 4-1/2 - All*	4 - All*	10.25	5.63	4.94	EB016F	7316		3	3.1500	3/4	3.25	BN-16

Journals & End Blocks Dimensions - Simple and Fixed

Simple Journal Ends

Acme Screw & Lead	Ball Screw & Lead	Type 1A, Type 1B - Simple Ends					Common Dimensions				
		A	B	E	End Block #	Bearing Number	C	D**	F	G	Lock Nut #
1/2 - All*	1/2 - All*	1.92	0.64	0.35	EB000S	6200	0.313	0.3936	1/8	1.25	SN-00
0.63 - All*, 3/4 - All*	0.63 - All*	2.13	0.84	0.47	EB001S	6301	0.406	0.4723			SN-01
1 - All*	3/4 - All*	2.35	1.00	0.55	EB003S	6303	0.562	0.6692			SN-02
1 x .100	1, 1.17 - All*	2.44	1.13	0.59	EB004S	6304	0.625	0.7873	3/16		SN-04
1-1/2 x .375	1-1/2 x .047, 1-1/2 x 1.00	2.78	1.26	0.67	EB005S	6305	0.875	0.9842			SN-05
1-1/2 - All*, 2 x .500	1-1/2 x .250, 1-1/2 x .500, 1-1/2 x 1.875	3.11	1.30	0.75	EB006S	6306	1.00	0.1810	1/4		SN-06
2 x .500, 2-1/4 x .500	2 - All*	3.71	1.47	0.91	EB008S	6308	1.375	1.5747	5/16	1.88	SN-08
2-1/4 x .250	2-1/4 - All*	3.76	1.68	0.98	EB009S	6309		1.7716			SN-09
2-1/2 - All*	—	4.69	1.69	1.06	EB010S	6310	1.75	1.9684	3/8	2.75	SN-10
3 - All*	3 - All*	5.50	1.93	1.22	EB012S	6312	2.25	2.3621	1/2	3.38	SN-12
3-3/4, 4-1/2 - All*	4 - All*	6.75	2.13	1.44	EB016F	6316	3	3.1500	3/4	3.25	BN-16

Note: Unless otherwise specified all dimensions are in Inches.

Duff-Norton does not warrant that each journal's drive end is capable of lifting the full rated load capacity - actual results may vary from application to application.

Bearing journals for some screws may show a slight thread trace along the journal diameter; this is not detrimental, and has been designed this way to fit each screw into the largest bearing support possible.

All leads for that diameter screw except where noted

Standard journal tolerances are as follows - Journals 00 - 04 are +.0000 / - .0004, Journals 05 - 10 are +.0000 / -.0005, Journal 12 is +.0000 / -.0006

Duff-Norton's End Blocks and Screw End Journals are the key to assembling a complete screw and nut system from the Drive End all the way through to Control End. Our End Blocks follow the conventional style, and together with a special journal design allow the user to integrate the following Duff-Norton components:

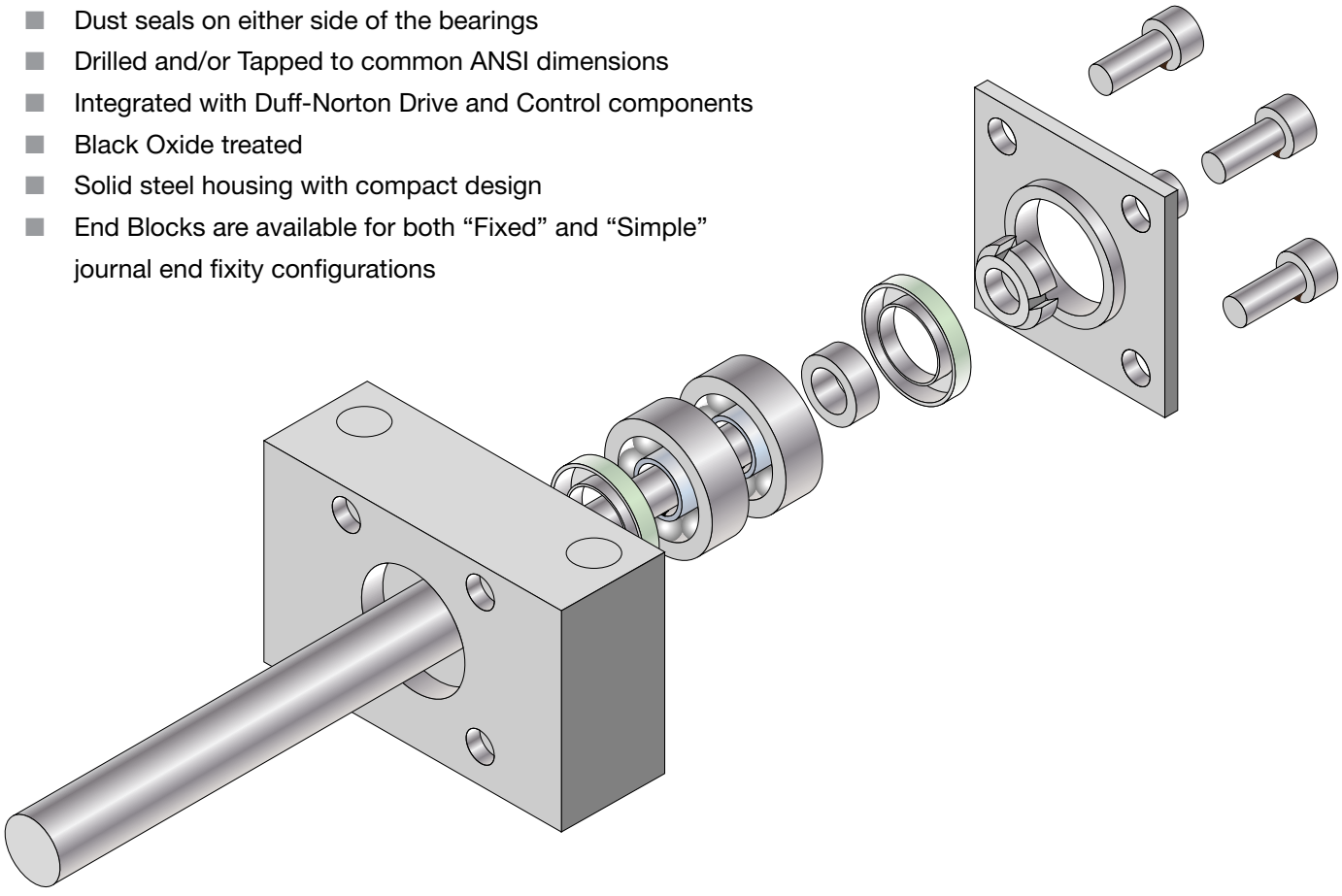
- Motor Flanges: Servo, IEC, NEMA frame motors
- Gearmotors: brake, non-brake, IEC, NEMA gearmotors closely coupled with Duff-Norton Motor Flanges
- Ring Kit Encoders: coupled between Duff-Norton motor flanges and motors or gear motors
- Limit Switches and Potentiometers
- Control panels – custom designed for each application

How does this work?

Simply remove the bolts from the End Block's face plate, and use the longer bolts provided in the Duff-Norton kit for that drive or control component for mounting that component to the block face. All mounting holes and surfaces have been designed for proper fit. Duff-Norton specialty screw end journals have also been specifically designed to properly mate with each of these control and drive components.

FEATURES & BENEFITS

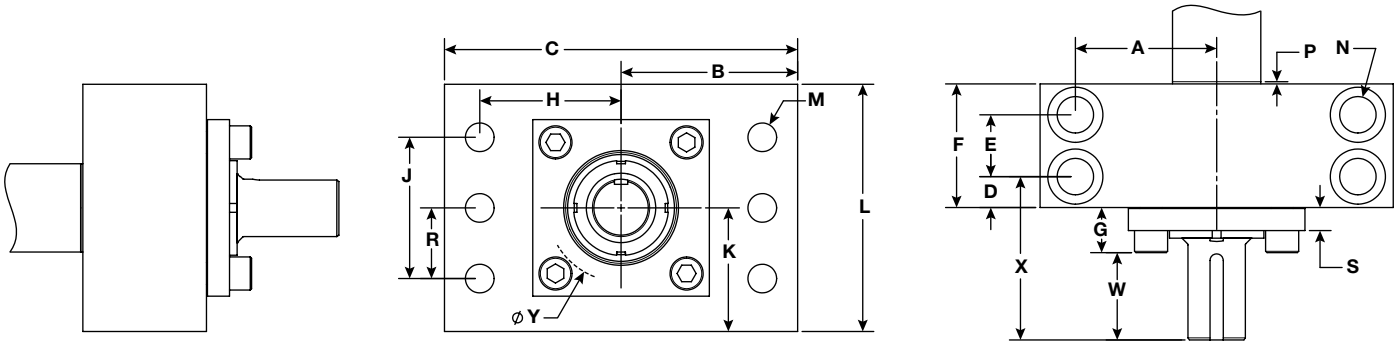
- Angular Contact Bearings for excellent radial and thrust load ratings
- Dust seals on either side of the bearings
- Drilled and/or Tapped to common ANSI dimensions
- Integrated with Duff-Norton Drive and Control components
- Black Oxide treated
- Solid steel housing with compact design
- End Blocks are available for both "Fixed" and "Simple" journal end fixity configurations



End Block Performance Specifications - Fixed

End Block Part Number	Acme Screw & Lead	Ball Screw & Lead	Bearing Bore (mm)	Basic Dyn. Cap.	Basic Stat. Cap.	Locknut
EB000F	1/2 - All*	1/2 - All*	10	1972	2179	BN-00
EB001F	5/8 - All*, 3/4 - All*	0.63 - All*	12	4141	4280	BN-01
EB003F	1 - All*	3/4 - All*	17	5837	6917	BN-03
EB004F	1 x .100	1, 1.17 - All*	20	6823	8344	BN-04
EB005F	1-1/2 x .375	1-1/2 x .047, 1-1/2 x 1.00	25	9623	12623	BN-05
EB006F	1-1/2 - All*, 2 x .500	1-1/2 x .250, 1-1/2 x .500, 1-1/2 x 1.875	30	12226	17725	BN-06
EB008F	2 x .250, 2-1/4 x .500	2 - All*	40	17747	26371	BN-08
EB009F	2-1/4 x .250	2-1/4 - All*	45	23072	34585	BN-09
EB010F	2-1/2 - All*	—	50	26818	41502	BN-10
EB012F	3 - All*	3 - All*	60	35495	57065	BN-12
EB016F	3-3/4, 4-1/2 - All*	4 - All*	80	53242	94243	BN-16

*All leads for that diameter screw except where noted Note: Unless otherwise specified all dimensions are in inches.



End Block Dimensions - Fixed

End Block Part No.	Bearing ID (mm)	A & H	B	C	D	E	F	G	J	K	L	M	N	P	R	S	W	X	Y
EB000F	10	1.125	1.50	3.00	0.63	—	1.25	0.47	1.375	1.375	2.38	4 Holes 0.281 Diameter	2 Holes 0.281 Dia. thru 0.50 C-bore x 0.56 DP	0.03	0.688	0.22	1.28	2.375	1.40
EB001F	12	1.50	2.00	4.00	0.75	—	1.50	0.48	1.500	1.313	2.50	4 Holes 0.281 Diameter	2 Holes 0.406 Dia. thru 0.625 C-bore x .875 DP	0.03	0.750	0.23	1.27	2.500	1.40
EB003F	17	1.75	2.38	4.50	0.875	—	1.75	0.65	1.500	1.750	3.13	4 Holes 0.406 Diameter	2 Holes 0.531 Dia. thru 0.81 C-bore x 1.125 DP	0.03	0.750	0.40	1.22	2.750	2.00
EB004F	20	1.75	2.38	5.00	1.00	—	2.00	0.65	1.750	1.750	3.13	4 Holes 0.469 Diameter	2 Holes 0.656 Dia. thru 1.00 C-bore x 1.312 DP	0.03	0.875	0.40	1.35	3.000	2.00
EB005F	25	2.38	3.25	6.5	1.00	—	2.00	0.71	2.000	2.500	4.38	4 Holes 0.656 Diameter	2 Holes 0.906 Dia. thru 1.375 C-bore x 2.00 DP	0.06	1.000	0.40	1.66	3.375	2.53
EB006F	30	2.50	3.50	6.50	1.00	—	2.00	0.90	2.500	2.500	4.75	4 Holes 0.656 Diameter	2 Holes 0.906 Dia. thru 1.375 C-bore x 2.00 DP	0.06	1.250	0.53	1.72	3.625	2.94
EB008F	40	4.00	5.00	10.00	0.75	1.50	3.00	1.28	4.000	3.500	7.00	6 Holes 0.656 Diameter	4 Holes 0.781 Dia. thru 1.188 C-bore x 2.00 DP	0.06	2.000	0.65	1.85	3.875	4.31
EB009F	45	4.00	5.00	10.00	0.90	1.75	3.50	1.28	4.000	3.500	7.00	6 Holes 0.812 Diameter	4 Holes 1.031 Dia. thru 1.562 C-bore x 2.00 DP	0.06	2.000	0.65	1.97	4.125	4.31
EB010F	50	4.00	5.00	10.00	1.10	1.75	3.50	1.28	4.000	3.500	7.00	6 Holes 0.812 Diameter	4 Holes 1.031 Dia. thru 1.562 C-bore x 2.00 DP	0.06	2.000	0.65	2.72	4.875	4.31
EB012F	60	4.00	5.00	10.00	1.00	2.35	4.00	1.28	4.000	3.500	7.00	6 Holes 0.812 Diameter	4 Holes 1.031 Dia. thru 1.562 C-bore x 2.00 DP	0.06	2.000	0.65	3.22	5.500	5.41
EB016F	80	5.00	6.25	12.50	1.00	3.00	5.00	1.62	5.500	4.500	8.50	6 Holes 0.812 Diameter	4 Holes 1.031 Dia. thru 1.562 C-bore x 2.00 DP	0.06	2.750	0.75	3.63	6.250	6.75

Note: Unless otherwise specified all dimensions are in Inches.

Note: Duff-Norton does not warrant that these typical Journal End and End Block combinations are capable of accepting the amount of torque and axial load required to drive their respective screw and nut assembly to its full rated capacity. Careful analysis by the customer should be done to ensure the Duff-Norton journal end meets the application requirements.

Note: Duff-Norton always recommends driving the screw and nut system from the fixed end. The “Fixed” - “Simple” screw end configuration and End Block combination is the recommended configuration for most applications.

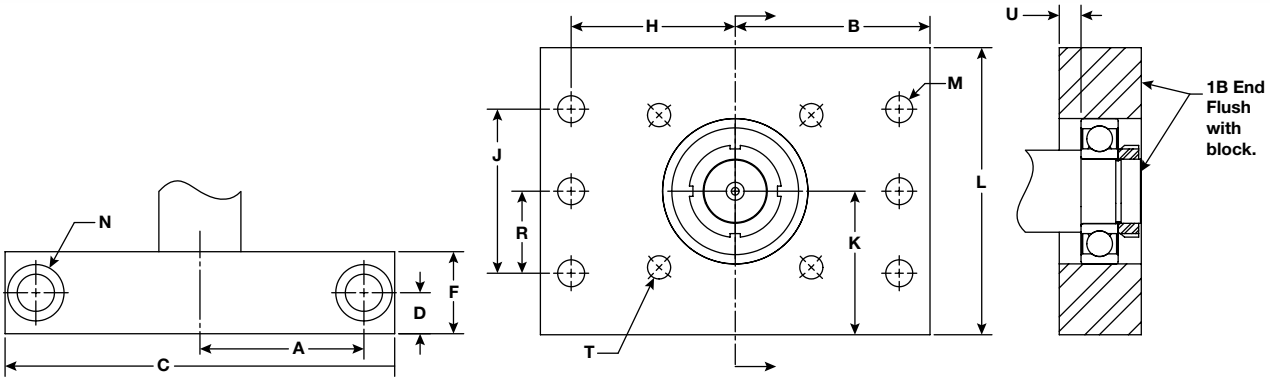
PERFORMANCE SPECIFICATIONS & DIMENSIONS - SIMPLE

End Block Performance Specifications - Simple

End Block Part Number	Acme Screw & Lead	Ball Screw & Lead	Bearing Bore (mm)	Locknut
EB000S	1/2 - All*	1/2 - All*	10	BN-00
EB001S	0.63 - All*, 3/4 - All*	0.63 - All*	12	BN-01
EB003S	1 - All*	3/4 - All*	17	BN-03
EB004S	1 x .100	1, 1.17 - All*	20	BN-04
EB005S	1-1/2 x .375	1-1/2 x .047, 1-1/2 x 1.00	25	BN-05
EB006S	1-1/2 - All*, 2 x .500	1-1/2 x .250, 1-1/2 x .500, 1-1/2 x 1.875	30	BN-06
EB008S	2-1/4 x .500	2 - All*	40	BN-08
EB009S	2 x .250	2-1/4 - All*	45	BN-09
EB010S	2-1/4 X .250, 2-1/2 - All*	—	50	BN-10
EB012S	3 - All*	3 - All*	60	BN-12
EB016F	3-3/4, 4-1/2 - All*	4 - All*	80	BN-16

*All leads for that diameter screw except where noted

Note: Unless otherwise specified all dimensions are in inches.



End Block Dimensions - Simple

End Block Part No.	Bearing ID (mm)	A & H	B	C	D	F	J	K	L	M	N	R	T	U
EB000S	10	1.125	1.50	3.00	0.38	0.75	1.375	1.375	2.38	4 Holes 0.281 Diameter	2 Holes 0.281 Dia. thru 0.50 C-bore x 0.56 DP	0.688	4 Holes 1/4-20 Tap 1.78" B.C.	0.10
EB001S	12	1.50	2.00	4.00	0.50	1.00	1.500	1.313	2.50	4 Holes 0.281 Diameter	2 Holes 0.406 Dia. thru 0.625 C-bore x .875 DP	0.750	4 Holes 1/4-20 Tap 1.78" B.C.	0.15
EB003S	17	1.75	2.38	4.75	0.50	1.00	1.500	1.750	3.13	4 Holes 0.406 Diameter	2 Holes 0.531 Dia. thru 0.81 C-bore x 1.125 DP	0.750	4 Holes 5/16-18 Tap 2.375" B.C.	0.00
EB004S	20	1.75	2.38	4.75	0.63	1.25	1.750	1.750	3.13	4 Holes 0.469 Diameter	2 Holes 0.656 Dia. thru 1.00 C-bore x 1.312 DP	0.875	4 Holes 5/16-18 Tap 2.375" B.C.	0.13
EB005S	25	2.38	3.25	6.50	0.88	1.75	2.000	2.500	4.38	4 Holes 0.656 Diameter	2 Holes 0.906 Dia. thru 1.375 C-bore x 2.00 DP	1.000	4 Holes 5/16-18 Tap 3.00" B.C.	0.50
EB006S	30	2.50	3.50	7.00	0.88	1.75	2.500	2.500	4.75	4 Holes 0.656 Diameter	2 Holes 0.906 Dia. thru 1.375 C-bore x 2.00 DP	1.250	4 Holes 3/8-16 Tap 3.50" B.C.	0.45
EB008S	40	4.00	5.00	10.00	1.25	2.00	4.000	3.500	7.00	6 Holes 0.656 Diameter	2 Holes 0.781 Dia. thru 1.188 C-bore x 2.00 DP	2.000	4 Holes 5/8-11 Tap 5.25" B.C.	0.53
EB009S	45	4.00	5.00	10.00	1.25	2.50	4.000	3.500	7.00	6 Holes 0.812 Diameter	2 Holes 1.031 Dia. thru 1.562 C-bore x 2.00 DP	2.000	4 Holes 5/8-11 Tap 5.25" B.C	0.38
EB010S	50	4.00	5.00	10.00	1.25	2.50	4.000	3.500	7.00	6 Holes 0.812 Diameter	2 Holes 1.031 Dia. thru 1.562 C-bore x 2.00 DP	2.000	4 Holes 5/8-11 Tap 5.25" B.C	0.75
EB012S	60	4.00	5.00	10.00	1.25	2.50	4.000	3.500	7.00	6 Holes 0.812 Diameter	2 Holes 1.031 Dia. thru 1.562 C-bore x 2.00 DP	2.000	4 Holes 5/8-11 Tap 6.36" B.C.	0.62
EB016S	80	5.00	6.25	12.50	1.25	2.50	5.000	4.500	8.50	6 Holes 0.812 Diameter	2 Holes 1.313 Dia. thru 1.562 C-bore x 2.00 DP	2.750	4 Holes 7/8-9 Tap 8.00" B.C.	0.37

Note: Unless otherwise specified all dimensions are in Inches.

Note: Duff-Norton does not warrant that these typical Journal End and End Block combinations are capable of accepting the amount of torque and axial load required to drive their respective screw and nut assembly to its full rated capacity. Careful analysis by the customer should be done to ensure the Duff-Norton journal end meets the application requirements.

Note: Duff-Norton always recommends driving the screw and nut system from the fixed end. The “Fixed” - “Simple” screw end configuration and End Block combination is the recommended configuration for most applications.

DRIVE SYSTEM COMPONENTS

MOTOR

Duff-Norton can competitively supply motors for any application from suppliers such as Baldor, Nord, US Electric, Leeson and more.

Motors can be directly mounted to most Duff-Norton actuators using C-face adapters, directly mounted via speed reducers, or remotely mounted with shafting and couplings. IEC, servo, hydraulic, and air motors can also be supplied upon request.

FEATURES

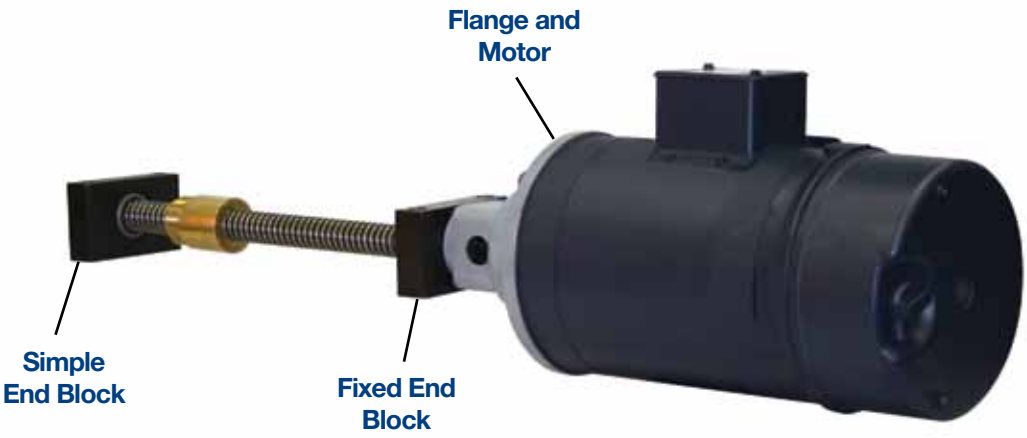
Standard Motor Options:

- Brake and non-brake models
- Single and three phase models
- Explosion proof, washdown duty
- Wide variety of voltages & RPM's
- 50/60Hz models
- 1/4 to 10 Horsepower ratings
- Common NEMA frame sizes

www.duffnorton.com
Ph: (800) 477-5002 • Fax: (704) 588-1994

COMPONENTS

MOTOR FLANGES - SCREW & NUT SYSTEMS



Duff-Norton provides complete close coupled Motor to Screw & Nut systems to Limit Switch systems for all application needs. These systems use our End Blocks and Motor Flanges to mount the respective drive and control components into one package. Common system components are:

- Motor Flanges: Servo, IEC, NEMA frame motors
- Servo, IEC, or NEMA motors: brake, non-brake, closely mounted to Duff-Norton Motor Flanges
- Ring Kit Encoders (optional): mounted between Duff-Norton NEMA Motor Flanges and NEMA motors
- Couplings – needed to connect the screw's journal to the motor shaft - will be included in the motor flange kits.
- Acme or Ball Screw and Nut, with special length screw journal ends
- Limit Switches and Potentiometers (optional)
- Control panels – custom designed for each application

Our standard motor flanges use the most common and appropriately sized motor frames. Common flange and frame sizes available are:

- Servo Flanges: our IEC flanges are compatible with most common European made servo motors
- IEC Flanges: B14 and B5 – frame size varies by screw diameter
- NEMA Flanges: C56, C143, and C182 – for most screw diameters

Motor Flange Assortment

Acme Screw & Nut	Ball Screw & Nut	Fixed End Block No.	NEMA Flanges	IEC/Servo Flanges
0.5 - All*	0.5 - All*	EB000F	MFN000-C56, MFN000-C143	MFE000-63B14, MFE000-71B14, MFE000-80B14, MFE000-90B14
0.63 - All*, 0.75 - All*	0.63 - All*	EB001F	MFN000-C56, MFN000-C143	MFE001-63B14, MFE001-71B14, MFE001-80B14, MFE001-90B14
1 - All*	0.75 - All*	EB003F	MFN003-C56, MFN003-C143, MFN003-C182	MFE003-71B5, MFE003-80B5, MFE003-90B5, MFE003-100B14, MFE003-112B14
1 x .100	1, 1.17 - All*	EB004F	MFN004-C56, MFN004-C143, MFN004-C182	MFE004-71B5, MFE004-80B5, MFE004-90B5, MFE004-100B14, MFE004-112B14
1.5 x .375	1.5 - All*	EB005F	MFN005-C56, MFN005-C143, MFN005-C182	MFE005-80B5, MFE005-100B14, MFE005-112B14
1.5 - All*, 2 x .500	1.5 x 1.875	EB006F	MFN006-C56, MFN006-C143, MFN006-C182	MFE006-80B5, MFE006-100B14, MFE006-112B14
2 X .250, 2.25 X .500	2 - All*	EB008F	MFN008-C182, MFN008-C213	N/A
2.25 x .250	2.25 - All*	EB009F	MFN009-C182, MFN009-C213	N/A
2.5 - All*	—	EB010F	MFN010-C182, MFN010-C213	N/A

All leads for that diameter screw except where noted

Our motor flanges can be purchased as a kit along with our End Blocks and Limit Switches to form a complete drive system. Motor flange kits include:

- Motor flange
- All required mounting hardware
- Couplings will be specified and should be provided with the Motor Flange kit

NEMA C-Face Performance Specifications

Our performance tables below show directly coupled motorized performance for each screw type's diameters and leads which coordinate with our motor flanges. Screw diameter and lead along with Speed and Maximum Stroke are listed in columns along the table's left side. RPM and Horsepowers are listed in rows along the table's top. Actual lifting capacities are shown throughout the table's body under their respective horsepower size.

To calculate your own Speed and Lifting Capacity for other motor types, horsepowers, or voltages and hertz ratings not shown; Duff-Norton advises using the following formulas:

Speed (in/min):	Motor RPM X Screw Lead
Capacity (lbs):	Motor Torque (in-lb) = HP X 63025/RPM
	Capacity = Motor Torque Screw Torque to Raise 1 lb.

NOTE: Critical speeds vs. stroke lengths, column strength, compressed loads vs. tension loads (page 135) must be considered when a screw is directly coupled to a motor and turning at high RPM. For these applications Duff-Norton always recommends using the "Fixed-Simple" mounting option. Tension loads are often preferred for vertical applications to enable longer stroke lengths. Duff-Norton advises using the following formula

to help determine your systems maximum stroke length:

Max Stroke Length = $\sqrt{(4056 \times \text{root diameter})}$

PV Values (page 136) should be consulted as well.

ACME SCREW/NEMA PERFORMANCE SPECIFICATIONS

Acme Screw Performance - 1/2 to 1 Inch Diameters - Right Hand or Left Hand Threads

Acme Diameter & Lead	Speed (in/min)	*Max Screw Length	Motor Flange + (frame size)	End Block Model #	Motor HP (1725 rpm) / Frame Size Capacity (pounds) See Notes **								
					1/4-56C	1/3-56C	1/2-56C	3/4-56C	1-56C	1.5-140C	2-140C	3-180C	5-180C
050 x 010 Bronze Nut	172.50	39	MFN000 + (Frame)	EB000F	199	264	397	596	794	1191	1589	1941	N/A
050 x 020 Bronze Nut	345.00				145	193	290	435	580	870	1160	1219	
050 x 025 Bronze Nut	431.25				129	171	257	386	515	772	908	908	
050 x 050 Bronze Nut	862.50				80	107	160	240	320	481	641	783	
050 x 025 Plastic Nut	431.50	39	MFN000 + (frame)	EB000F	155	206	310	464	619	665	N/A	N/A	N/A
050 x 050 Plastic Nut	862.50				90	120	181	271	362	543	665	N/A	N/A
063 X 010 Bronze Nut	172.50	45	MFN001 + (Frame)	EB001F	169	225	338	507	677	1015	1353	2030	2897
063 X 013 Bronze Nut	215.63				157	210	315	472	630	945	1260	1890	2836
063 X 020 Bronze Nut	345.00				129	171	257	386	515	772	1029	1544	1544
063 X 025 Bronze Nut	431.25				117	156	234	351	468	703	937	1137	N/A
063 X 050 Bronze Nut	862.50				75	100	150	225	299	449	599	898	1163
063 X 025 Plastic Nut	431.25	45	MFN001 + (Frame)	EB001F	143	190	285	428	571	828	828	N/A	N/A
063 X 050 Plastic Nut	862.50				86	115	172	259	345	517	689	808	N/A
075 x 010 Bronze Nut	172.50	45	MFN001 + (Frame)	EB001F	147	196	295	442	589	884	1179	1768	2946
075 x 020 Bronze Nut	345.00				120	160	240	361	481	721	961	1442	2404
075 x 025 Bronze Nut	431.25				110	147	220	330	440	660	880	1231	2201
075 x 050 Bronze Nut	862.50				73	97	146	219	292	438	585	877	1461
075 x 100 Bronze Nut	1725.00				42	57	85	127	170	255	340	510	850
075 x 025 Plastic Nut	431.25	45	MFN001 + (Frame)	EB001F	136	182	273	409	545	818	1091	1636	1652
075 x 050 Plastic Nut	862.50				84	112	168	251	335	503	670	1006	1501
075 x 100 Plastic Nut	1725.00				47	63	94	141	188	282	377	565	942
100 x 010 Bronze Nut	172.50	55	MFN004+(Fra	EB004F	116	154	231	347	462	694	925	1387	2312
100 x 020 Bronze Nut	345.00		MFN003 + (Frame)	EB003F	99	132	231	298	397	596	794	1191	1986
100 x 025 Bronze Nut	431.25				93	124	186	280	373	559	746	1118	1864
100 x 050 Bronze Nut	862.50				65	87	130	196	261	391	522	783	1305
100 x 100 Bronze Nut	1725.00				40	54	80	121	161	241	322	483	805
100 x 025 Plastic Nut	431.25	55	MFN003 + (Frame)	EB003F	119	158	237	356	474	712	949	1423	2239
100 x 050 Plastic Nut	862.50				77	103	155	232	310	464	619	929	1548
100 x 100 Plastic Nut	1725.00				45	60	90	136	181	271	362	543	904

Note: Cells with blue shading mean the combination of screw and motor horsepower exceed the screw & nut's dynamic load rating
Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute. Catalog performance assumes 230/460VAC, 3ø, 60Hz are being used.

Acme Screw Performance - 1-1/2 to 2-1/2 Inch Dia. - Right Hand or Left Hand Threads

Acme Diameter & Lead	Speed (in/min)	*Max Screw Length	Motor Flange + (frame size)	End Block Model #	Motor HP (1725 rpm) / Frame Size Capacity (pounds) See Notes **										
					1/4-56C	1/3-56C	1/2-56C	3/4-56C	1-56C	1.5-140C	2-140C	3-180C	5-180C	7.5-210C	10-210C
150 x 010 Bronze Nut	172.50	70	MFN006 + (Frame)	EB006F	82	110	165	247	329	494	658	987	1646	N/A	N/A
150 x 020 Bronze Nut	345.00				74	99	149	223	297	446	594	891	1485		
150 x 025 Bronze Nut	431.25				70	94	141	211	281	422	562	843	1405		
150 x 038 Bronze Nut	646.88			EB005F	60	80	119	179	239	358	478	716	1194		
150 x 050 Bronze Nut	862.50			EB006F	53	70	106	158	211	317	422	634	1056		
150 x 100 Bronze Nut	1725.00				35	47	70	105	140	210	280	420	700		
150 x 025 Plastic Nut	431.25	70	MFN006 + (Frame)	EB006F	94	125	188	282	377	565	753	1130	1883	N/A	N/A
150 x 038 Plastic Nut	646.88				77	102	154	230	307	461	614	921	1535		
150 x 050 Plastic Nut	862.50				66	88	131	197	263	394	526	789	1314		
150 x 100 Plastic Nut	1725.00				41	54	81	122	162	244	325	489	812		
200 x 025 Bronze Nut	431.25	80	MFN010 + (Frame)	EB008F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	677	1128	1691	2255
200 x 050 Bronze Nut	862.50			EB006F	46	62	93	139	185	278	371	556	927	N/A	N/A
225 x 025 Bronze Nut	431.25	86	MFN010 + (Frame)	EB008F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	612	1021	1531	2041
225 x 050 Bronze Nut	862.50			EB009F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	515	858	1286	1715
225 x 025 Bronze Nut	431.25	92	MFN010 + (Frame)	EB010F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	562	1021	1405	1874
225 x 050 Bronze Nut	862.50				N/A	N/A	N/A	N/A	N/A	N/A	N/A	479	798	1197	1595

Note: N/A means motor adapter for these motor frame sizes, and screw diameters are not available.

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute. Catalog performance assumes 230/460VAC, 3ø, 60Hz are being used.

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BALL SCREW/NEMA PERFORMANCE SPECIFICATIONS

Ball Screw Performance - 1/2 to 1.17 Inch Dia. - Right Hand or Left Hand Threads

Ball Diameter & Lead	Speed (in/min)	*Max Screw Length	Motor Flange + (frame size)	End Block Model #	Motor HP (1725 rpm) / Frame Size Capacity (pounds) See Notes **								
					1/4-56C	1/3-56C	1/2-56C	3/4-56C	1-56C	1.5-140C	2-140C	3-180C	5-180C
050 x 020 Double Return	345.00	41	MFN000+(frame)	EB000F	261	348	522	783	1044	1200	N/A	N/A	N/A
050 x 050 Double Return	862.50				104	138	208	311	415	623	830	859	N/A
063 x 020 Single Return	345.00	45	MFN001+(Frame)	EB001F	261	348	522	783	800	N/A	N/A	N/A	N/A
063 x 100 Double Return	1725.00				52	69	103	155	206	310	413	578	N/A
075 x 020 Single Return	345.00	52	MFN003+(Frame)	EB003F	261	348	522	783	950	N/A	N/A	N/A	N/A
075 x 020 Double Return									1044	1566	1900	N/A	N/A
075 x 050 Double Return	862.50				104	138	208	311	415	623	830	1246	2076
100 x 025 Single Return	345.00	58	MFN004+(Frame)	EB004F	208	277	415	623	830	1246	1612	N/A	N/A
100 x 025 Double Return											1661	2491	3350
100 x 050 Double Return	862.50				103	137	205	308	411	616	821	1232	2053
100 x 100 Double Return	1725.00				52	69	103	155	206	310	413	619	1032
117 x 041 Double Return	712.43	59	MFN004+(Frame)	EB004F	125	167	250	375	500	751	1001	1501	2502

Note: N/A means motor adapter for these motor frame sizes, and screw diameters is not available.

Note: Cells with Blue Shading mean the combination of screw and motor Horse power exceeds the screw & nut's dynamic load rating.

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute. Catalog performance assumes 230/460VAC, 3ø, 60Hz are being used.

Ball Screw Performance - 1-1/2 to 2-1/4 Inch Dia. - Right Hand or Left Hand Threads

Ball Diameter & Lead	Speed (in/min)	*Max Screw Length	Motor Flange + (frame size)	End Block Model #	Motor HP (1725 rpm) / Frame Size Capacity (pounds) See Notes **										
					1/4-56C	1/3-56C	1/2-56C	3/4-56C	1-56C	1.5-140C	2-140C	3-180C	5-180C	7.5-210C	10-210C
150 x 025 Double Rtn	431.25	68	MFN005 + (Frame)	EB006F	208	277	415	623	830	1246	1661	2491	4152	N/A	N/A
150 x 047 Double Rtn	815.93			EB005F	109	145	217	326	435	652	870	1305	2175		
150 x 050 Double Rtn	862.50			EB006F	103	137	205	308	411	616	821	1232	2053		
150 x 100 Double Rtn	1725.00			EB005F	52	69	104	156	208	311	415	623	1038		
150 x 187 Double Rtn	3234.38	69	MFN006 + (Frame)	EB006F	28	37	55	83	110	165	220	330	550		
200 x 050 Double Rtn	862.50	84	MFN008 + (Frame)	EB008F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1246	2076	3135	4152
200 x 100 Double Rtn	1725.00				N/A	N/A	N/A	N/A	N/A	N/A	N/A	623	1038	1567	2076
225 x 050 Double Rtn	862.50	87	MFN009 + (Frame)	EB009F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1246	2076	3135	4152
225 x 100 Double Rtn	1725.00	68			N/A	N/A	N/A	N/A	N/A	N/A	N/A	623	1038	1567	2076

Note: N/A means motor adapter for these motor frame sizes, and screw diameters is not available.

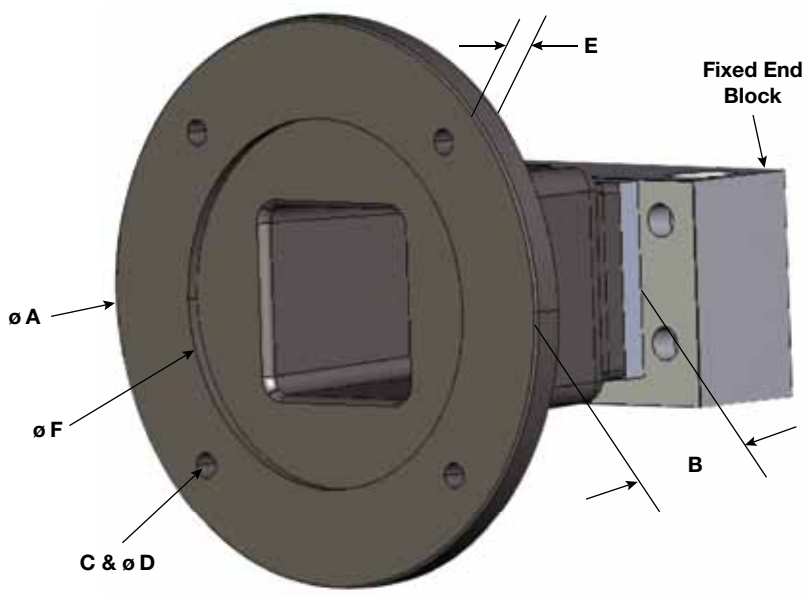
Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute. Catalog performance assumes 230/460VAC, 3ø, 60Hz are being used.

Ball Screw

Acme Screw

COMPONENTS

MOTOR FLANGE DIMENSIONS



NEMA - Motor Flanges

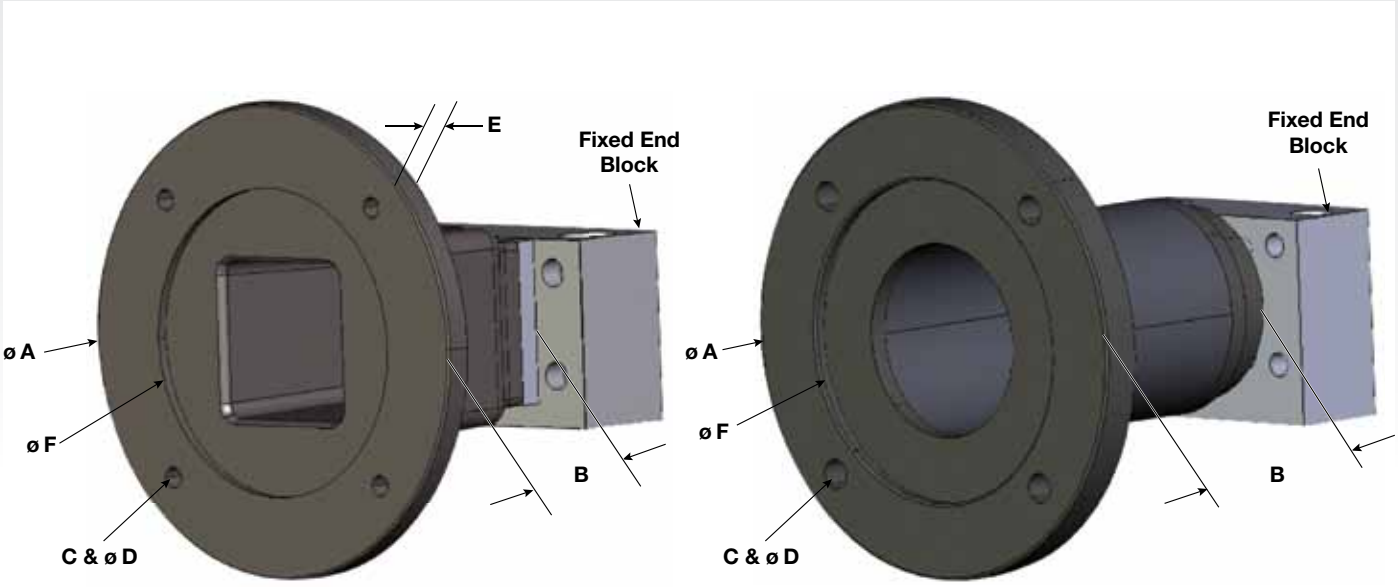
NEMA Flanges	A Flange O.D.	B Flange Length**	C Mounting Holes B.C.	D Mounting Holes Dia.	E Mounting Hole Depth	F Counter Bore Dia.	G Through Holes
MFN000-C56, MFN000-C143*, MFN001-C56, MFN001-C143*	6.75	4.48	5.87	.406	.47	4.502	1.87 Sq.
MFN003-C56, MFN003-C143*, MFN004-C56, MFN004-C143*		4.68			.56		2.63 Sq.
MFN003-C182, MFN004-C182	9.00	5.52	7.25	.531	1.38	8.502	
MFN005-C56, MFN005-C143*	6.75	5.19	5.87	.406	.60	4.502	4.25 Dia.
MFN005-C182	9.00	6.03	7.25	.531	1.38	8.502	
MFN006-C56, MFN006-C143*	6.75	5.32	5.87	.406	.97	4.502	3.50 Sq.
MFN006-C182***	9.00	6.05	7.25	.531	1.38	8.502	
MFN008-C182, MFN009-C182, MFN010-C182		9.125			.31		4.00 Dia.
MFN008-C213, MFN009-C213, MFN010-C213	11.13	9.625	9.00		.81	10.502	

Note: All dimensions are shown in inches. All couplings are purchased separately from the motor flange kit.

* 143C frame models use the 56C frame with an appropriately sized coupling to fit the 143 motor shaft dimensions

** Excludes the pilot dimensions which recess into a counter bore in the Fixed End Blocks' face plate

*** Uses an adapter plate mounted to the MFN006-C56 Flange



B5 Flange Configuration

B14 Flange Configuration

Servo / IEC - Motor Flanges

Servo / IEC Flanges	A Flange O.D.	B Flange Length**	C Mounting Holes B.C.	D Mounting Holes Dia.	E Mounting Hole Depth	F Counter Bore Dia.	G Through Holes
MFE000-63B14, MFE001-63B14	90	83	75	6	12.7	60	57.2 Dia.
MFE001-71B14, MFE001-71B14	105	90	85	7		70	
MFE001-80B14, MFE001-80B14	120	100	100			80	
MFE001-90B14, MFE001-90B14	140	110	115	9		95	
MFE003-71B5, MFE004-71B5	160	116	130	M8 Tap	12.4	110	66.7 Sq.
MFE003-80B5, MFE004-80B5	200		165	M10 Tap		130	
MFE003-90B5, MFE004-90B5							
MFE003-100B14, MFE004-100B14	160	119	130	9	15.7	110	
MFE003-112B14, MFE004-112B14							
MFE005-80B5	200	128	165	M10 Tap	12.2	130	107.95 Dia.
MFE005-90B5							
MFE005-100B14*	190	138	130	9	10.0	110	
MFE005-112B14*							
MFE006-80B5	200	131	165	M19 Tap	20.1	130	88.9 Sq.
MFE006-90B5							
MFE006-100B14*	190	141	130	9	10.0	110	
MFE006-112B14*							

Note: All dimensions are shown in millimeters. All couplings are purchased separately from the motor flange kit.

* Uses an adapter plate mounted to the MFE005-90B5, or MFE006-90B5 Flanges respectively.

* Adapter plates should be mounted to the motor, and then to the motor flange.

** Excludes the pilot dimensions which recess into a counter bore in the Fixed End Blocks' face plate.

DRIVE SYSTEM COMPONENTS

GEARMOTOR / SCREW & NUT SYSTEMS

Duff-Norton provides complete close coupled Gearmotor / Screw & Nut systems / Limited Switch systems for all application needs. These systems use our End Blocks and Motor Adapters to mount the respective drive and control components into one package. Common system components are:

- Gearmotors: Servo type functionality (available upon request) and compact frame sizes, brake, non-brake,
  - NEMA gearmotors closely mounted to Duff-Norton motor flanges.
  - Integral gearmotors are 230/460VAC, 3ø, 60HZ standard.
  - Brakemotors are Inverter Duty / Vector Duty rated to NEMA MG-1 standards.
  - Close-mounted inverters are available upon request.
  - 1000 : 1 constant torque turndown ratio available, 5 : 1 constant torque turndown ratio standard.
- Motor Flanges (depending on overall system size)
- Couplings (depending on overall system size)
- Acme or Ball Screw and Nut, with special length screw journal ends
- Limit Switches and Potentiometers (optional)
- Control panels – custom designed for each application

Gearmotors and Motor Flanges are sold separately as kits. Gearmotors are supplied as assemblies. Mounting Kits can be purchased which include:

- Motor flange
- All required mounting hardware
- Coupling

NOTE: Mounting Kit components will vary as from size to size, especially for the larger size screw diameters where the screw shaft is inserted into the gearmotors hollow bore. All mounting kits have been properly specified for their matched gearmotors.

NOTE

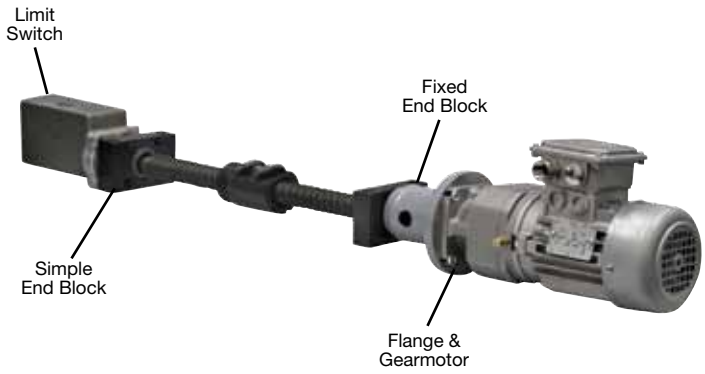
Mounting Kit components will vary as from size to size, especially for the larger size screw diameters where the screw shaft is inserted into the gearmotors hollow bore. All mounting kits have been properly specified for their matched gearmotors.

Gearmotor Performance Specifications

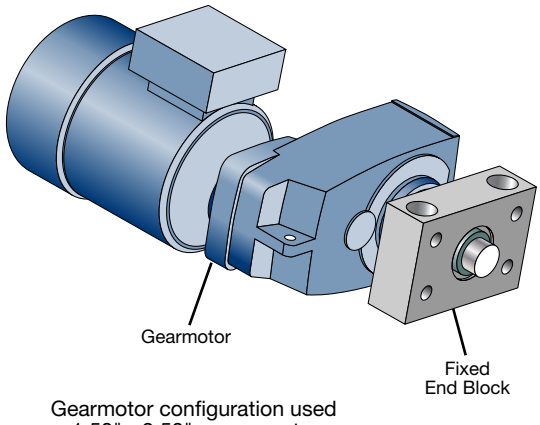
Our performance tables show typical motorized performance for each screw type's diameters and leads which integrate with our motor flanges, and gearmotor selections. Screw Diameter and Lead along with Speed are listed in columns along the table's left side. RPM's and Horsepowers are listed in rows along the table's top. Actual lifting capacities are shown throughout out the table's body under their respective horse-power sizes.

To calculate your own Speed and Lifting Capacity for other motor types, horsepowers, voltages and hertz ratings, or gear ratios not shown Duff-Norton advises using the following formulas:

Speed (Acme or Ball):	Speed = Screw RPM x Screw Lead
	Screw RPM = Motor RPM/Reducer Ratio
Capacity (Acme):	Capacity = Screw Torque / Torque to Raise 1 lb.
	Screw Torque = (Motor Torque x Reduction) x Reducer Efficiency
	Motor Torque = 63025 x HP / RPM
Capacity (Ball):	Capacity = Screw Torque / .177 x Screw Lead
	Screw Torque = (Motor Torque x Reduction) x Reducer Efficiency
	Motor Torque = 63025 x HP / RPM



Gearmotor configuration used on .500" - 1.17" screw systems.



Gearmotor configuration used on 1.50" - 2.50" screw systems.

NOTE

Critical speeds vs. stroke lengths, column strength, compressed loads vs. tension loads (charts start on page 137) must be considered when a screw is directly coupled to a motor and turning at high RPM's. For these applications Duff-Norton always recommends using the "Fixed-Simple" mounting option. Tension loads are often preferred for vertical applications to enable longer stroke lengths. Duff-Norton advises using the following formula to help determine your systems maximum stroke length.

Max Stroke Length = SQRT(4056 x root diameter) PV Values (catalog page 134) should be consulted as well.

ACME SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS

Gearmotor configuration used on 1/2" - 1" screw systems.

1/2 Inch Acme Screw & Nut

Acme Dia. & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Model No.	Motor HP (1725 RPM) Capacity (lbs.) - See notes below			
						1/6 HP	1/4 HP	1/3 HP	1/2 HP
050 x 010 Bronze Nut	NB07F	4.77	36.2	EB00-NB07F	EB000F	606	909	1211	1819
		5.96	28.9			757	1136	1513	1826
		7.23	23.9			9.18	1378	1826	—
		8.00	21.6			1016	1525		—
		10.00	17.3			1269	1826	—	—
		11.56	14.9			1468		—	—
050 x 020 Bronze Nut	NB07F	4.77	72.3	EB00-NB07F	EB000F	442	664	884	1219
		5.96	57.9			552	830	1105	
		7.23	47.7			670	1006	1219	—
		8.00	43.1			742	1113		—
		10.00	34.5			927	1219	—	—
		11.56	29.8			1072		—	—
050 x 025 Bronze Nut	NB07F	4.77	90.4	EB00-NB07F	EB000F	392	589	785	908
		5.96	72.4			490	736	908	—
		7.23	59.6			595	893		—
		8.00	53.9			658	908	—	—
		10.00	43.1			822		—	—
		11.56	37.3			908	—	—	—
050 x 050 Bronze Nut	NB07F	4.77	180.8	EB00-NB07F	EB000F	244	367	489	734
		5.96	144.7			305	458	611	783
		7.23	119.3			370	556	741	
		8.00	107.8			410	615	783	—
		10.00	86.3			512	769		—
		11.56	74.6			592	783	—	—
050 x 025 Bronze Nut	NB07F	2.10	205.4	EB00-NB07F	EB000F	208	312	416	624
		2.57	167.8			254	382	509	665
		2.95	146.2			292	438	584	
		3.58	120.5			354	532	665	—
		3.92	110.0			388	583		—
		4.77	90.4			472	665	—	—
050 x 050 Plastic Nut	NB07F	2.10	410.7	EB00-NB07F	EB000F	121	182	243	365
		2.57	335.6			149	223	297	446
		2.95	292.4			171	256	341	512
		3.58	240.4			207	311	414	622
		3.92	220.0			227	340	453	665
		4.77	180.8			276	414	552	

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

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ACME SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS

5/8 Inch Acme Screw & Nut

Acme Dia. & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Model No.	Motor HP (1725 RPM) Capacity (lbs.) - See notes below			
						1/6 HP	1/4 HP	1/3 HP	1/2 HP
063 x 010 Bronze Nut	NB07F	4.77	36.2	EB01-NB07F	EB001F	516	775	1032	1549
		5.96	28.9			645	968	1289	1936
		7.23	23.9			782	1174	1564	2348
		8.00	21.6			865	1299	1730	2598
		10.00	17.3			1081	1624	2163	2897
		11.56	14.9			1250	1877	2500	
063 x 013 Bronze Nut	NB07F	4.77	45.2	EB01-NB07F	EB001F	480	721	961	1442
		5.96	36.2			600	901	1200	1802
		7.23	29.8			728	1093	1456	2186
		8.00	27.0			805	1209	1611	2419
		10.00	21.6			1007	1512	2014	2836
		11.56	18.7			1164	1748	2328	
063 x 020 Bronze Nut	NB07F	4.77	72.3	EB01-NB07F	EB001F	392	589	785	1178
		5.96	57.9			490	736	908	1472
		7.23	47.7			595	893	1189	1544
		8.00	43.1			658	988	1316	
		10.00	34.5			822	1235	1544	—
		11.56	29.8			951	1428		—
063 x 025 Bronze Nut	NB07F	4.77	90.4	EB01-NB07F	EB001F	357	536	714	1072
		5.96	72.4			446	670	892	1137
		7.23	59.6			541	813	1083	
		8.00	53.9			599	899	1137	—
		10.00	43.1			749	1124		—
		11.56	37.3			865	1137	—	—
063 x 025 Bronze Nut	NB07F	4.77	180.8	EB01-NB07F	EB001F	228	343	457	686
		5.96	144.7			285	428	571	857
		7.23	119.3			346	520	692	1039
		8.00	107.8			383	575	766	1150
		10.00	86.3			479	719	957	1163
		11.56	74.6			553	831	1107	
063 x 025 Plastic Nut	NB07F	2.10	205.4	EB01-NB07F	EB001F	192	288	383	575
		2.57	167.8			234	352	469	704
		2.95	146.2			269	404	538	808
		3.58	120.5			327	490	653	828
		3.92	110.0			358	537	715	
		4.77	90.4			435	654	828	—
063 x 050 Plastic Nut	NB07F	2.10	410.7	EB01-NB07F	EB001F	116	174	231	347
		2.57	335.6			142	213	283	425
		2.95	292.4			163	244	325	488
		3.58	240.4			197	296	394	592
		3.92	220.0			216	324	432	649
		4.77	180.8			263	395	526	789

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

ACME SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS

3/4 Inch Acme Screw & Nut - Right Hand or Left Hand Threads

Acme Dia. & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Model No.	Motor HP (1725 RPM) Capacity (Pounds) - See notes below				
						1/4 HP	1/3 HP	1/2 HP	3/4 HP	1 HP
075 x 010 Bronze Nut	NB07F	4.77	36.2	EB01-NB07F	EB001F	675	899	1349		
		6.57	26.3			929	1238	1858		
		8.91	19.4			1260	1679	2520		
		11.56	14.9			1635	2178	3173		
		15.77	10.9			2230	2971			
		19.20	9.0			2715	3617	—		
075 x 020 Bronze Nut	NB07F	4.77	72.3	EB01-NB07F	EB001F	550	733	1101		
		6.57	52.5			758	1010	1516		
		8.91	38.7			1028	1369	2056		
		11.56	29.8			1334	1777	2588		
		15.77	21.9			1820	2424			
		19.20	18.0			2215	2951	—		
075 x 025 Bronze Nut	NB07F	4.77	90.4	EB01-NB07F	EB001F	504	671	1008		
		6.57	65.6			694	925	1388		
		8.91	48.4			941	1254	1883		
		11.56	37.3			1221	1627	2370		
		15.77	27.3			1666	2219			
		19.20	22.5			2028	2702	—		
075 x 050 Bronze Nut	NB17	4.62	186.7	EB01-NB07F	EB001F	324	432	648	972	1296
		5.77	149.5			405	539	810	1214	1574
		7.08	121.8			497	662	993	1490	
		7.83	110.2			549	732	1099	1574	—
		9.79	88.1			687	915	1374		—
		11.39	75.7			799	1064	1574	—	—
		13.54	63.7			950	1265		—	—
		15.76	54.7			1106	1473		—	—
075 x 100 Bronze Nut	NB17F	4.62	373.4	EB01-NB07F	EB001F	188	251	377	565	754
		5.77	299.0			235	313	471	706	915
		7.08	243.6			289	385	578	866	
		7.83	220.3			319	425	639	915	—
		9.97	176.2			399	532	799		—
		11.39	151.4			465	619	915	—	—
		13.54	127.4			552	736		—	—
		15.76	109.5			643	856		—	—
075 x 025 Plastic Nut	NB07F	2.95	146.2	EB01-NB07F	EB001F	386	514	772		
		3.58	120.5			469	624	937		
		3.92	110.0			513	683	1026		
		4.77	90.4			624	832	1249		
		5.96	72.4			780	1039	1560		
		7.23	59.6			946	1260	1652		
075 x 050 Plastic Nut	NB07F	2.95	292.4	EB01-NB07F	EB001F	237	316	475		
		3.58	240.9			288	384	576		
		3.92	220.0			315	420	631		
		4.77	180.8			384	511	767		
		5.96	144.7			479	639	959		
		7.23	119.3			582	775	1163		
075 x 100 Plastic Nut	NB07F	4.77	361.6	EB01-NB07F	EB001F	216	287	431		
		5.96	289.4			269	359	539		
		7.23	238.6			327	435	654		
		8.00	215.6			362	482	723		
		10.00	172.5			452	602	904		
		11.56	149.2			523	696	1015		

Reducer And Horsepower Combinations Not Available.

Reducer And Horsepower Combinations Not Available.

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

Note: Cells with blue shaded N.A. indicate a combination of horsepower and gear ratio that is not available.

ACME SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS

1 Inch Acme Screw & Nut - Right Hand or Left Hand Threads

Acme Dia. & Lead	Gear-motor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Mod.No.	Motor HP (1725 RPM) Capacity (Pounds) - See notes below						
						1/4 HP	1/3 HP	1/2 HP	3/4 HP	1 HP	1.5 HP	2 HP
100 x 010 Bronze Nut	NB17H	4.62	37.3	EB04-NB07H	EB004F	513	683	1026	1538	2051	3077	4102
		5.77	29.9			640	853	1281	1921	2562	3843	5124
		7.08	24.4			786	1047	1572	2358	3143	4715	6287
		7.83	22.0			869	1158	1738	2607	3476	5215	6939
		9.79	17.6			1087	1447	2173	3260	4347	6520	
		11.39	15.1			1264	1684	2528	3793	5057	N/A	N/A
		13.54	12.7			1503	2002	3006	4509	6012	N/A	N/A
		15.76	10.9			1749	2330	3499	5248	6939	N/A	N/A
100 x 020 Bronze Nut	NB17H	4.62	74.7	EB03-NB07H	EB003F	440	587	881	1321	1761	2642	3523
		5.77	59.8			550	733	1100	1650	2200	3300	4400
		7.08	48.7			675	899	1350	2024	2699	4049	5398
		7.83	44.1			746	994	1493	2239	2985	4478	5672
		9.79	35.2			933	1243	1866	2799	3732	5599	
		11.39	30.3			1086	1446	2171	3257	4342	N/A	N/A
		13.54	25.5			1291	1719	2581	3872	5162	N/A	N/A
		15.76	21.9			1502	2001	3004	4506	5672	N/A	N/A
100 x 025 Bronze Nut	NB17H	4.62	93.3	EB03-NB07H	EB003F	413	551	827	1240	1654	2480	3307
		5.77	74.7			516	688	1033	1549	2065	3098	4130
		7.08	60.9			633	844	1267	1900	2534	3801	5068
		7.83	55.1			701	933	1401	2102	2802	2404	5325
		9.79	44.1			876	1167	1752	2628	3504	5256	
		11.39	37.9			1019	1357	2038	3057	4077	N/A	N/A
		13.54	31.9			1212	1614	2423	3635	4846	N/A	N/A
		15.76	27.4			1410	1878	2820	4230	5325	N/A	N/A
100 x 050 Bronze Nut	NB17H	4.62	186.7	EB03-NB07H	EB003F	289	385	579	868	1157	1736	2315
		5.77	149.5			361	481	723	1084	1446	2168	2891
		7.08	121.8			443	591	887	1330	1774	2661	3548
		7.83	110.2			490	653	981	1471	1962	2943	3727
		9.79	88.1			613	817	1226	1840	2453	3697	
		11.39	75.7			713	950	1427	2140	2854	N/A	N/A
		13.54	63.7			848	1130	1696	2544	3392	N/A	N/A
		15.76	54.7			987	1315	1974	2961	3727	N/A	N/A
100 x 100 Bronze Nut	NB17H	4.62	373.4	EB03-NB07H	EB0003F	178	238	357	535	714	1071	1428
		5.77	299.0			223	297	446	669	892	1337	1783
		7.08	243.6			273	364	547	820	1094	1641	2188
		7.83	220.3			302	403	605	907	1210	1815	2299
		9.79	176.2			387	504	756	1135	1513	2269	
		11.39	151.4			440	586	880	1320	1760	N/A	N/A
		13.54	127.4			523	697	1046	1569	2092	N/A	N/A
		15.76	109.5			609	811	1218	1826	2299	N/A	N/A
100 x 025 Plastic Nut	NB17H	4.62	93.3	EB03-NB07H	EB003F	526	701	1052			These Screw & Nut dynamic load ratings have already been exceeded, or the combinatiion of the horsepower and gear ratio is not advisable.	
		5.77	74.7			657	875	1314		2239		
		7.08	60.9			806	1074	1613		—		
		7.83	55.1			892	1188	1783	2239	—		
		9.79	44.1			1115	1485	2230		—		
		11.39	37.9			1297	1728	2239	N/A	N/A		
		13.54	31.9			1542	2054		N/A	N/A		
		15.76	27.4			1795	2239	N/A	N/A	N/A		
100 x 050 Plastic Nut	NB17H	4.62	186.7	EB03-NB07H	EB003F	343	457	687	1030	1373		
		5.77	149.5			429	571	858	1286	1715		
		7.08	121.8			526	701	1052	1578	2019		
		7.83	110.2			582	775	1164	1746			
		9.79	88.1			728	969	1455	2019	N/A		
		11.39	75.7			846	1127	1693	N/A	N/A		
		13.54	63.7			1006	1340	2012	N/A	N/A		
		15.76	54.7			1171	1560	2019	N/A	N/A		
100 x 100 Plastic Nut	NB17H	4.62	373.4	EB03-NB07H	EB003F	201	267	401	602	802	1203	1604
		5.77	299.0			250	334	501	751	1002	1503	2004
		7.08	243.6			307	409	615	922	1229	1844	2209
		7.83	220.3			340	453	680	1020	1360	2039	
		9.79	176.2			425	566	850	1275	1700	2209	N/A
		11.39	151.4			494	659	989	1483	1978		N/A
		13.54	127.4			588	783	1176	1763	2209	N/A	N/A
		15.76	109.5			684	911	1368	2052		N/A	N/A

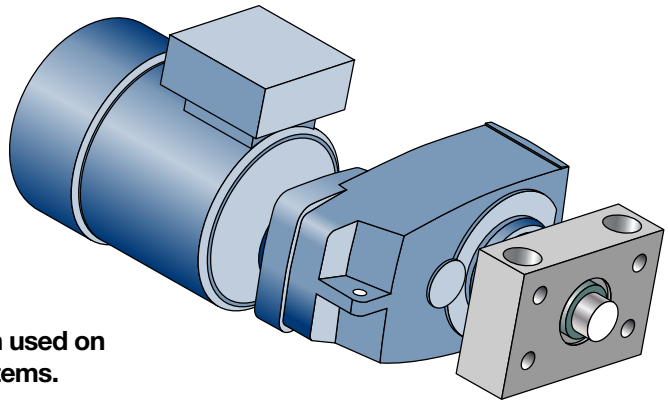
Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

Cells with blue shaded N.A. indicate a combination of horsepower and gear ratio that is not available.

ACME SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS



Gearmotor configuration used on 1 1/2" - 2 1/2" screw systems.

1-1/2 Inch Acme Screw & Nut - Right Hand or Left Hand Thread

Acme Dia. & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Model No.	Motor HP (1725 RPM) Capacity (Pounds) - See notes below			
						1.5 HP	2 HP	3 HP	5 HP
150 x 010 Bronze Nut	NC12C	4.79	36.0	EB06-NC12C	EB006F	2270	3027	4541	7568
		6.43	26.8			3048	4064	6095	10159
		8.24	20.9			3906	5207	7811	11869
		10.34	16.7			4901	6535	9802	
		14.11	12.2			6688	8917	11869	N/A
		17.21	10.0			8157	10876		N/A
		20.57	8.4			9750	13000		N/A
		28.33	6.1			13428	11869	N/A	N/A
150 x 025 Bronze Nut	NC12C	4.79	90.0	EB06-NC12C	EB006F	1939	2585	3877	6462
		6.43	67.1			2602	3470	5205	8674
		8.24	52.3			3335	4446	6670	11116
		10.34	41.7			4185	5580	8369	11869
		14.11	30.6			5710	7614	11421	N/A
		17.21	25.1			6965	9287	11869	N/A
		20.57	21.0			8325	11100		N/A
		28.33	15.2			11465	11869	N/A	N/A
150 x 038 Bronze Nut	NC12E	4.79	135.0	EB06-NC12E	EB005F	1647	2196	3294	5490
		6.43	100.6			2211	2948	4422	7370
		8.24	78.5			2833	3778	5667	6445
		10.34	62.6			3556	4741	7111	9495
		14.11	45.8			4852	6469	9495	N/A
		17.21	37.6			5918	7891		N/A
		20.57	31.4			7073	9495	—	N/A
		28.33	22.8			9495	—	N/A	N/A
150 x 050 Bronze Nut	NC12C	4.79	180.1	EB06-NC12C	EB006F	1457	1942	2913	4856
		6.43	134.1			1955	2607	3911	6518
		8.24	104.7			2506	3341	5012	8353
		10.34	83.4			3145	4193	6289	10482
		14.11	61.1			4291	5721	8582	N/A
		17.21	50.1			5234	6978	10468	N/A
		20.57	41.9			6256	8341	11869	N/A
		28.33	30.4			8616	11487	N/A	N/A

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

Note: Cells with blue shaded N.A. indicate a combination of horsepower and gear ratio that is not available.

ACME SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS

2 Inch Acme Screw & Nut - Right Hand or Left Hand Thread

Acme Dia. & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Model No.	Motor HP (1725 RPM) Capacity (lbs.) See Below		
						2 HP	3 HP	5 HP
200 x 025 Bronze Nut	NC22G	5.72	75.4	EB08-NC22G	EB008F	N/A	N/A	6192
		7.48	57.7			N/A	4859	8098
		9.03	47.8			N/A	5865	9775
		13.23	32.6			5729	8565	14322
		18.51	23.3			7848	11772	19621
		24.97	17.3			10587	15881	21912
		31.23	13.8			13242	19881	N/A
		43.71	9.9			18533	21912	N/A
200 x 050 Bronze Nut	NC22H	5.72	150.8	EB08-NC22G	EB008F	N/A	N/A	4986
		7.48	115.3			N/A	3912	6520
		9.03	95.5			N/A	4723	7871
		13.23	65.2			4613	6919	11532
		18.51	46.6			6454	9681	11869
		24.97	34.5			8706	11869	—
		31.23	27.6			10889		N/A
		43.71	19.7			11869	—	N/A

2-1/4 Inch Acme Screw & Nut

Acme Dia. & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Model No.	Motor HP (1725 RPM) Capacity (lbs.) See Below			
						2 HP	3 HP	5 HP	7.5 HP
225 x 025 Bronze Nut	NC32J	14.11	30.6	EB09-NC32J	EB009F	N/A	N/A	13824	20736
		16.67	25.9			N/A	N/A	16332	24498
		21.38	20.2			N/A	12568	20947	25382
		25.88	16.7			10142	15213	25356	
		31.93	13.5			12253	18379	25382	—
		42.02	10.3			16124	24187		N/A
		52.97	8.1			20326	25382	N/A	N/A
		64.12	6.7			24605		N/A	N/A
225 x 050 Bronze Nut	NC32G	14.11	61.1	EB08-NC22G	EB008F	N/A	N/A	11617	17426
		16.67	51.7			N/A	N/A	13725	18260
		21.38	40.3			N/A	10562	17603	
		25.88	33.3			8523	12785	18260	
		31.93	27.0			10297	15445		
		42.02	20.5			13551	18260		N/A
		52.97	16.3			17082		N/A	N/A
		64.12	13.5			18260		N/A	N/A

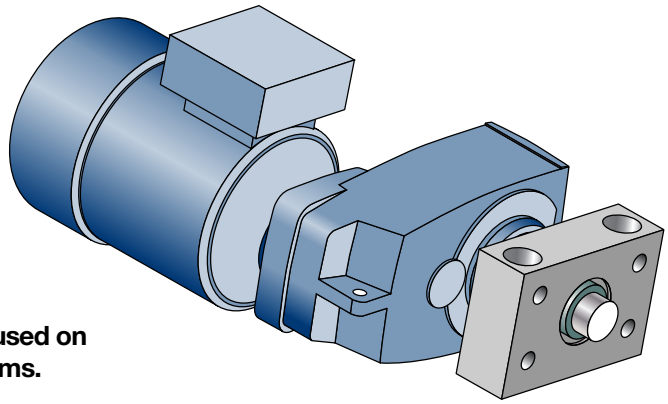
Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

Note: Cells with blue shaded N.A. indicate a combination of horsepower and gear ratio that is not available.

ACME SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS



Gearmotor configuration used on 1 1/2" - 2 1/2" screw systems.

2-1/2 Inch Acme Screw & Nut

Acme Dia. & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Model No.	Motor HP (1725 RPM) Capacity (lbs.) See Below			
						3 HP	5 HP	7.5 HP	10 HP
250 x 025 Bronze Nut	NC32J	8.31	51.90	EB10-NC32J	EB010F	N/A	7318	10977	14636
		11.38	37.90			N/A	10021	15032	20043
		14.11	30.56			N/A	12426	18638	24851
		20.18	21.37			10663	17771	25382	25382
		25.88	16.66			13674	22790		
		31.93	13.51			16871	25382		—
		42.02	10.26			22202		N/A	N/A
		52.97	8.14			27988	N/A	N/A	N/A
250 x 050 Bronze Nut	NC32J	8.31	103.79	EB10-NC32J	EB010F	N/A	6231	9347	12463
		11.38	75.79			N/A	8534	12800	17067
		14.11	61.13			N/A	10581	15871	21161
		20.18	42.74			9079	15132	22699	25382
		25.88	33.33			11644	19407	25382	33654
		31.93	27.01			14366	23943		—
		42.02	20.53			18906	25382	N/A	N/A
		52.97	16.28			23832	N/A	N/A	N/A

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

Note: Cells with blue shaded N.A. indicate a combination of horsepower and gear ratio that is not available.

BALL SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS

Gearmotor configuration used on 1/2" - 1.17" screw systems.

1/2 Inch Ball Screw & Nut

Ball Dia. & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Model No.	Motor HP (1725 RPM) Capacity (lbs.) See Below			
						1/6 HP	1/4 HP	1/3 HP	1/2 HP
050 x 020 Ball Nut - Double Return Tubes	NB07F	2.10	164.3	EB00-NB07F	EB000F	350	526	701	1052
		2.57	134.2			429	644	858	1200
		2.95	116.9			492	739	984	
		3.58	96.4			597	897	1195	
		3.92	88.0			654	982	1200	—
		4.77	72.3			796	1195		—
050 x 050 Ball Nut - Double Return Tubes	NB07F	2.10	410.7	EB00-NB07F	EB000F	139	209	279	419
		2.57	335.6			171	256	341	512
		2.95	292.4			196	294	392	588
		3.58	240.9			238	357	475	713
		3.92	220.0			260	391	520	781
		4.77	180.8			317	475	633	850

.631 Inch Ball Screw & Nut - Right Hand or Left Hand Threads

Ball Dia. & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Model No.	Motor HP (1725 RPM) Capacity (lbs.) See Below			
						1/6 HP	1/4 HP	1/3 HP	1/2 HP
063 x 020 Ball Nut	NB07F	2.10	164.3	EB01-NB07F	EB001F	350	526	701	800
		2.57	134.2			429	644	800	—
		2.95	116.9			492	739		—
		3.58	96.4			597	800	—	—
		3.92	88.0			654		—	—
		4.77	72.3			796		—	—
063 x 100 Ball Nut	NB07F	2.10	821.4	EB01-NB07F	EB001F	69	104	139	208
		2.85	605.3			94	141	188	282
		3.58	481.8			118	177	236	355
		4.77	361.6			157	236	315	473
		5.96	289.4			197	295	393	578
		8.00	215.6			264	396	528	

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

Note: Cells with blue shaded N.A. indicate a combination of horsepower and gear ratio that is not available.

BALL SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS

Gearmotor configuration used on 1/2" - 1.17" screw systems.

3/4 Inch Ball Screw & Nut

Ball Dia. & Lead	Gear-motor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Mod. No.	Motor HP (1725 RPM) Capacity (lbs.) - See Notes Below							
						1/6 HP	1/4 HP	1/3 HP	1/2 HP	3/4 HP	1 HP	1.5 HP	2 HP
075 x 020 Ball Nut - Single Return Tube	NB07H	2.10	164.3	EB03-NB07H	EB003F	350	526	701	950	Reducer and Horsepower combinations are not available			
		2.57	134.2			429	644	858					
		2.95	116.9			492	739	950	—				
		3.58	96.4			597	897		—				
		4.31	80.0			719	950	—	—				
		5.31	65.0			886		—	—				
075 x 020 Ball Nut - Double Return Tubes	NB07H	2.85	121.1	EB03-NB07H	EB003F	476	714	951	1428				
		3.58	96.4			597	897	1195	1794				
		4.31	80.0			719	1080	1438	1900				
		5.31	65.0			886	1330	1772					
		5.96	57.9			994	1493	1900	—				
		7.23	47.7			1206	1811		—				
075 x 050 Ball Nut - Double Return Tubes	NB17H	2.32	371.8	EB03-NB07H	EB003F	154	231	308	462	693	925	1387	1849
		2.72	317.1			180	271	361	542	813	1084	1626	2168
		3.22	267.9			214	321	427	642	962	1284	1925	2567
		3.79	227.6			252	378	503	755	1133	1511	2266	3021
		4.62	186.7			307	460	613	921	1381	1842	2762	3450
		5.77	149.5			383	575	766	1150	1725	2300	3449	N/A

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

Note: Cells with blue shaded N.A. indicate a combination of horsepower and gear ratio that is not available.

BALL SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS

Gearmotor configuration used on 1/2" - 1.17" screw systems.

1 Inch Ball Screw & Nut - Right Hand or Left Hand Threads

Ball Dia. & Lead	Gear-motor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Mod. No.	Motor HP (1725 RPM) Capacity (Pounds) - See Notes Below						
						1/4 HP	1/3 HP	1/2 HP	3/4 HP	1 HP	1.5 HP	2 HP
100 x 025 Ball Nut - Single Return Tube	NB07H	2.10	205.4	EB04-NB07H	EB004F	419	557	837	Reducer and Horsepower combinations are not available			
		2.57	167.8			512	682	1024				
		2.95	146.2			588	783	1176				
		3.58	120.5			713	950	1427				
		3.92	110.0			781	1041	1562				
		4.77	90.4			951	1266	1612				
100 x 025 Ball Nut - Double Return Tube	NB07H	2.95	146.2	EB04-NB07H	EB004F	588	783	1176				
		3.58	120.5			713	950	1427				
		4.77	90.4			951	1266	1901				
		5.96	72.4			1188	1582	2376				
		7.23	59.6			1441	1919	2882				
		8.91	48.4			1776	2365	3350				
100 x 050 Ball Nut - Double Return Tubes	NB17H	4.62	186.7	EB04-NB07H	EB004F	455	606	910	1366	1821	2731	3641
		5.77	149.5			568	757	1137	1705	2274	3411	3950
		7.08	121.8			698	929	1395	2093	2790	3950	—
		8.72	98.9			859	1144	1718	2577	3437		—
		11.39	75.7			1122	1495	2244	3367	3950	—	—
		13.54	63.7			1334	1777	2668	3950	—	—	—
100 x 100 Ball Nut - Double Return Tubes	NB17H	4.62	373.4	EB04-NB07H	EB004F	229	305	458	687	916	1373	1831
		5.77	299.0			286	381	572	858	1143	1715	2287
		7.08	243.6			351	467	701	1052	1403	2104	2400
		8.72	197.8			432	575	864	1296	1728	2400	N/A
		11.39	151.4			564	752	1129	1693	2257	N/A	N/A
		13.54	124.4			671	893	1342	2012	2400	N/A	N/A

1.17 Inch Ball Screw & Nut

Ball Dia. & Lead	Gear-motor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Mod. No.	Motor HP (1725 RPM) Capacity (Pounds) - See Notes Below						
						1/4 HP	1/3 HP	1/2 HP	3/4 HP	1 HP	1.5 HP	2 HP
117 x 041 Ball Nut - Double Return Tubes	NB17H	2.32	307.1	EB04-NB07H	EB004F	279	371	557	836	1115	1672	2229
		2.92	244.0			351	467	701	1052	1403	2104	2806
		3.79	188.0			455	606	911	1366	1821	2731	3642
		4.62	154.2			555	739	1110	1665	2220	3330	3894
		5.77	123.5			693	923	1386	2079	2772	3894	N/A
		7.08	100.6			850	1133	1701	2551	3402		N/A

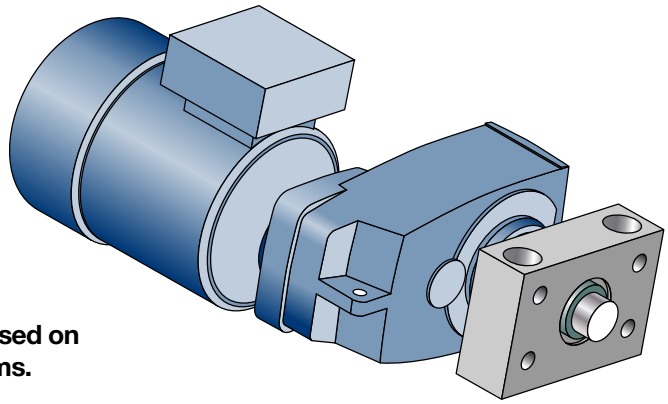
Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

Note: Cells with blue shaded N.A. indicate a combination of horsepower and gear ratio that is not available.

BALL SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS



Gearmotor configuration used on 1 1/2" - 2 1/2" screw systems.

1-1/2 Inch Ball Screw & Nut - Right Hand or Left Hand Threads

Ball Dia. & Lead	Gear-motor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Mod. No.	Motor HP (1725 RPM) Capacity (Pounds) - See Notes Below						
						1/2 HP	3/4 HP	1 HP	1.5 HP	2 HP	3 HP	5 HP
150 x 025 Ball Nut - Double Return Tubes	NC01B	4.24	101.7	EB05-NC01A	EB006F	1690	2535	3380	—	—	—	—
		5.34	80.8			2128	3193	4198	—	—	—	—
		6.35	67.9			2531	3796		—	—	—	—
		7.26	59.4			2894	4198	—	—	—	—	—
		8.64	49.9			3444		—	—	—	—	—
		9.49	45.4			3782		—	—	—	—	—
150 x 047 Ball Nut - Double Return Tubes	NC12E	5.47	149.2	EB05-NC12E	EB005F	1142	1713	2284	3426	4568	6852	9623
		6.43	126.9			1342	2014	2685	4027	5370	8055	
		8.24	99.0			1720	2581	3441	5161	6881	9623	—
		10.34	78.9			2159	3238	4318	6476	8635		—
		11.76	69.4			2455	3683	4910	7366	9623	—	—
		14.11	57.8			2946	4419	5892	8838		—	—
150 x 050 Ball Nut - Double Return Tubes	NC12E	5.47	157.7	EB05-NC12E	EB006F	1078	1617	2156	3234	4311	6467	9623
		6.43	134.1			1267	1901	2534	3801	5068	7602	
		8.24	104.7			1624	2436	3247	4871	6495	9623	—
		10.34	83.4			2037	3056	4075	6112	8150		—
		11.76	73.3			2317	3476	4635	6952	9269		—
		14.11	61.1			2780	4171	5561	8341	9623	—	—
150 x 100 Ball Nut - Double Return Tubes	NC12E	5.47	315.4	EB05-NC12E	EB005F	545	818	1090	1635	2180	3270	5451
		6.43	268.3			641	961	1281	1922	2563	3844	6407
		8.24	209.3			821	1232	1642	2463	3284	4926	8211
		10.34	166.8			1030	1545	2061	3091	4121	6182	9623
		11.76	146.7			1172	1758	2344	3515	4687	7031	
		14.11	122.3			1406	2109	2812	4218	5624	8436	
150 x 187 Ball Nut - Double Return Tubes	NC12C	6.43	503.0	EB06-NC12C	EB006F	340	509	679	1019	1359	2038	3397
		8.24	392.5			435	653	871	1306	1741	2612	4353
		10.34	312.8			546	819	1092	1639	2185	3277	5462
		11.76	275.0			621	932	1242	1864	2485	3727	6212
		14.11	229.2			745	1118	1491	2236	2981	4472	7453
		17.21	187.9			909	1364	1818	2727	3636	5455	9091

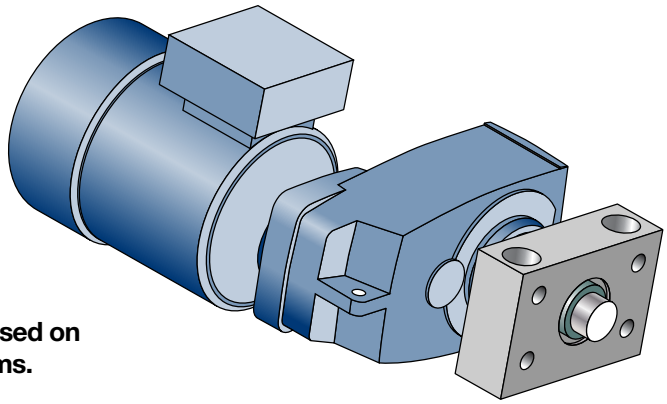
Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

Note: Cells with blue shaded N.A. indicate a combination of horsepower and gear ratio that is not available.

BALL SCREW / GEARMOTOR PERFORMANCE SPECIFICATIONS



Gearmotor configuration used on 1 1/2" - 2 1/2" screw systems.

2 Inch Ball Screw & Nut

Ball Diameter & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Model Number	Motor HP (1725 RPM) Capacity (Pounds) - See Notes Below		
						2 HP	3 HP	5 HP
200 x 050 Ball Nut - Double Return Tubes	NC22G	8.37	103.0	EB08-NC22G	EB008F	N/A	10008	16680
		9.03	95.5			N/A	10797	17996
		10.15	85.0			N/A	12137	18260
		11.81	73.0			9414	14122	
		13.23	65.2			10546	15820	
		16.53	52.2			13177	18260	N/A
200 x 100 Ball Nut - Double Return Tubes	NC22G	7.48	230.6	EB08-NC22G	EB008F	N/A	4472	7453
		8.37	206.1			N/A	5004	8340
		9.03	191.0			N/A	5399	8998
		10.15	170.0			N/A	6068	10114
		11.81	146.1			4707	7061	11768
		13.23	130.4			5273	7910	13183

2-1/4 Inch Ball Screw & Nut - Right Hand or Left Hand Threads

Ball Diameter & Lead	Gearmotor Model	Gear Ratio	Speed (in/min)	Mounting Kit Number	End Block Mod. No.	Motor HP (1725 RPM) Capacity (Pounds) - See Notes Below				
						2 HP	3 HP	5 HP	7.5 HP	10 HP
225 x 050 Ball Nut - Double Return Tubes	NC32J	8.31	103.8	EB09-NC32J	EB009F	N/A	9937	16561	21306	—
		9.80	88.0			7812	11718	19530		—
		11.38	75.8			9072	13607	21306	—	—
		14.11	61.1			11248	16872		—	—
		16.67	51.7			13289	19933		—	—
		20.18	42.7			16087	21306	—	—	—
225 x 100 Ball Nut - Double Return Tubes	NC32J	6.70	257.5	EB09-NC32J	EB009F	N/A	N/A	6676	10014	13352
		8.31	207.6			N/A	N/A	8280	12421	16561
		9.80	176.0			N/A	N/A	9765	14648	19530
		11.38	151.6			N/A	N/A	11340	17009	21912
		14.11	122.3			N/A	N/A	14060	21090	
		16.67	103.5			6644	9966	16611	21912	

Note: Unless otherwise specified, all capacities are in Pounds, all dimensions are in Inches, and all speeds are in inches per minute.

Note: Cells with blue shaded numbers indicate the combination of screw, motor horsepower, and gear ratio exceeds the screw and nut's dynamic load rating, or the End Block's basic dynamic capacity.

Note: Cells with blue shaded dashes indicate the dynamic load rating has already been exceeded once per horsepower.

Note: Cells with blue shaded N.A. indicate a combination of horsepower and gear ratio that is not available.

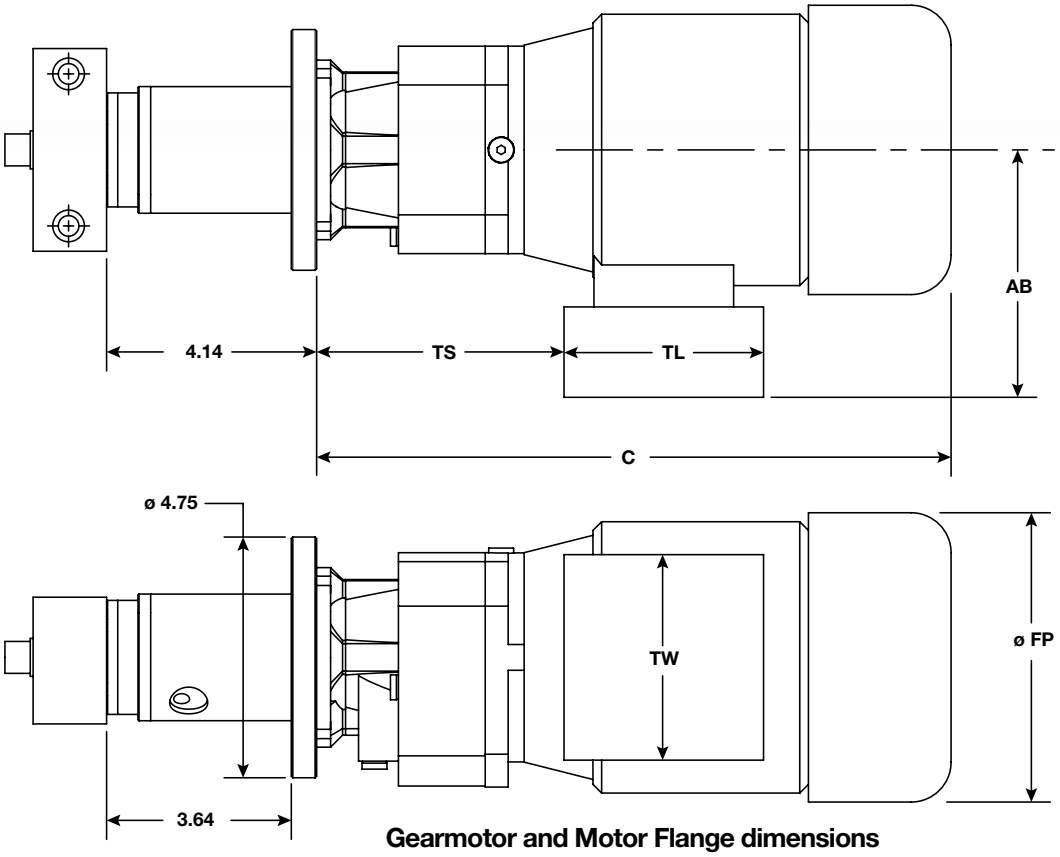
GEARMOTOR SCREW SYSTEM DIMENSIONS

Depending on system performance requirements Duff-Norton will recommend either of two system configurations:

Screw diameters 1/2" to 1.17"

System using screw diameters within this range feature the Gearmotor close mounted to the motor flange, which is then closed coupled to the screw mounted with End Blocks.

NOTE - See catalog page 94 for mounting positions.



Gearmotor and Motor Flange dimensions for 1/2" - 3/4" Acme Screws and 1/2" - .631" Ball Screws.

Gearmotor and Motor Flange Dimensions

NB072	FP	C	AB	TL	TW	TS	C (Brake)	AB (Brake)	TL (Brake)	TW (Brake)	TS (Brake)
1/6 HP	5.12	11.66	4.53	3.94	3.94	4.57	13.86	4.84	5.20	3.43	4.85
1/4 HP											
1/3 HP	5.71	12.52	4.88			4.88	14.81	5.24			5.15
1/2 HP											
NB172	**FP**	**C**	**AB**	**TL**	**TW**	**TS**	**C (Brake)**	**AB (Brake)**	**TL (Brake)**	**TW (Brake)**	**TS (Brake)**
1/6 HP	5.12	12.49	4.53	3.94	3.94	5.39	14.69	4.84	5.20	3.43	5.67
1/4 HP											
1/3 HP	5.71	13.35	4.88			5.71	15.63	5.24			5.15
1/2 HP											
3/4 HP	6.50	14.22	5.59	4.49	4.49	5.79	16.74	5.63	6.02	4.25	5.94
1 HP											
1.5 HP	7.20	15.79	5.79			5.94	18.74	5.83			6.10
2 HP											

Note: Unless otherwise specified all dimensions are in inches.

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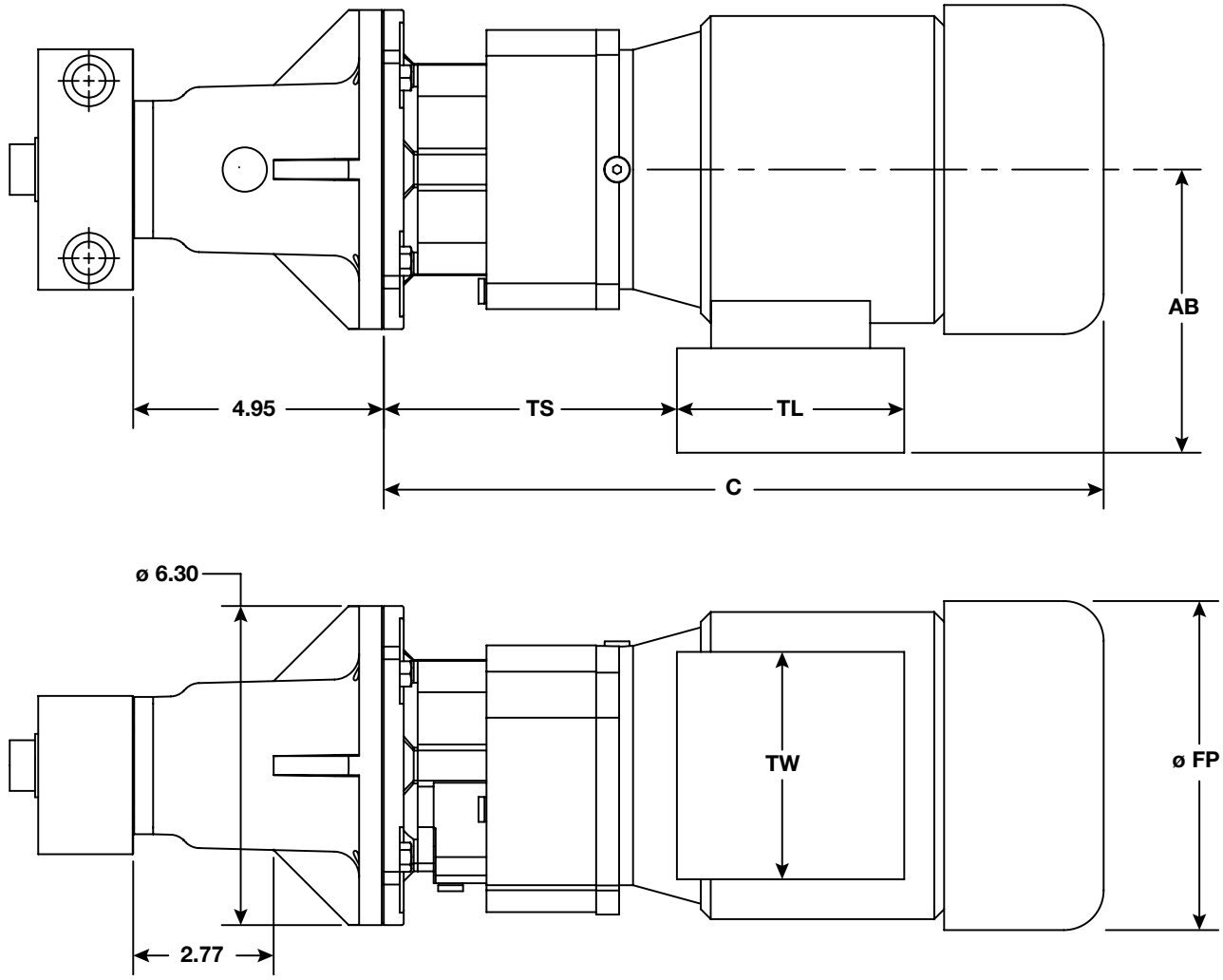
GEARMOTOR SCREW SYSTEM DIMENSIONS



Gearmotor and Motor Flange dimensions for all 1" Acme Screws and 3/4" - 1.17" Ball Screws

Gearmotor and Motor Flange Dimensions

NB072	FP	C	AB	TL	TW	TS	C (Brake)	AB (Brake)	TL (Brake)	TW (Brake)	TS (Brake)
1/6 HP	5.12	11.66	4.53	3.94	3.94	4.57	13.86	4.84	5.20	3.43	4.85
1/4 HP											
1/3 HP	5.71	12.52	4.88			4.88	14.81	5.24			5.15
1/2 HP											
NB172	**FP**	**C**	**AB**	**TL**	**TW**	**TS**	**C (Brake)**	**AB (Brake)**	**TL (Brake)**	**TW (Brake)**	**TS (Brake)**
1/6 HP	5.12	12.49	4.53	3.94	3.94	5.39	14.69	4.84	5.20	3.43	5.67
1/4 HP											
1/3 HP	5.71	13.35	4.88			5.71	15.63	5.24			5.15
1/2 HP											
3/4 HP	6.50	14.22	5.59	4.49	4.49	5.79	16.74	5.63	6.02	4.25	5.94
1 HP											
1.5 HP	7.20	15.79	5.79			5.94	18.74	5.83			6.10
2 HP											

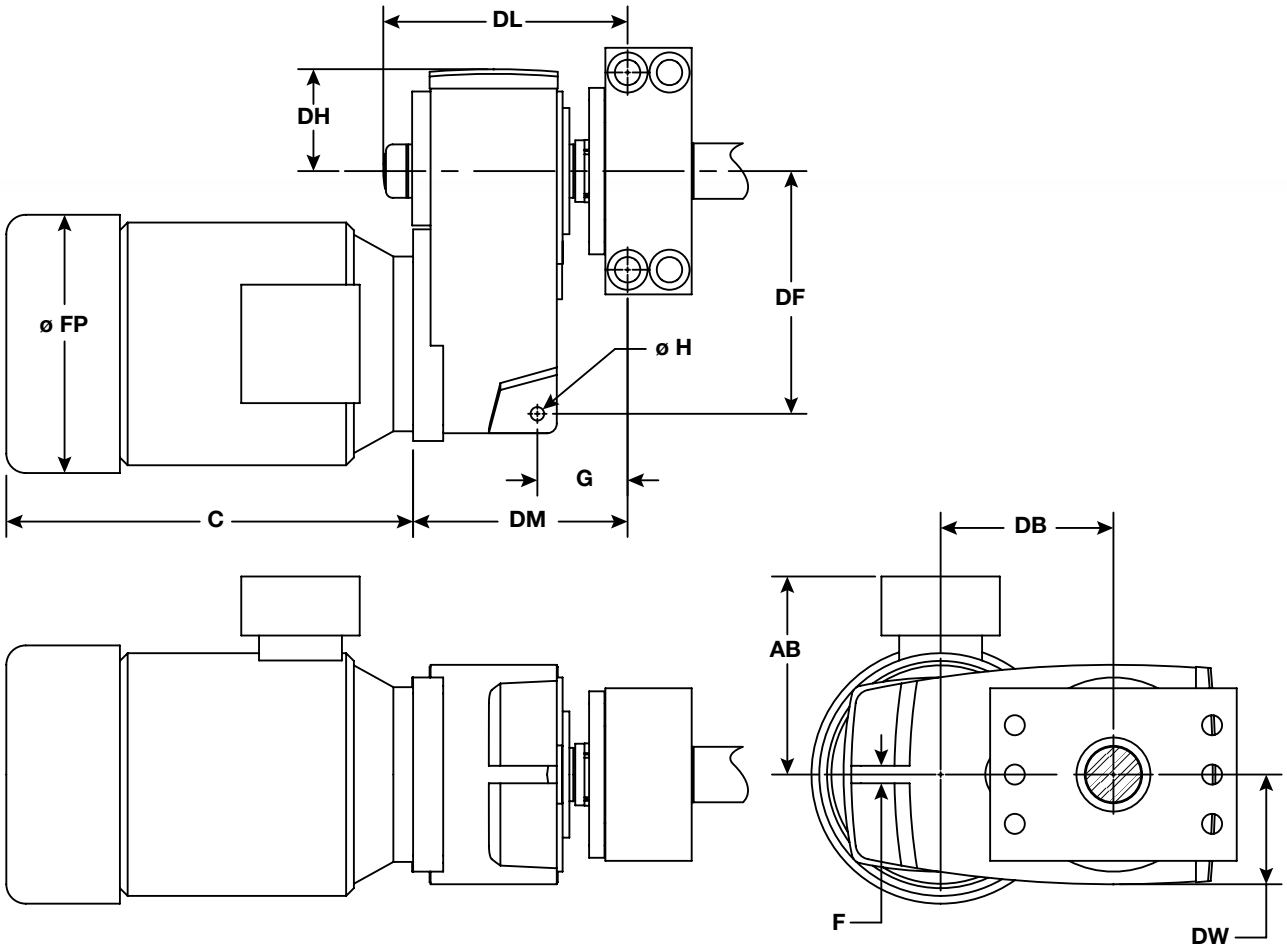
Note: Unless otherwise specified all dimensions are in inches.

GEARMOTOR SCREW SYSTEM DIMENSIONS

Screw diameters 1-1/2" to 2-1/2"

System using screw diameters within this range feature the Gearmotor with the screw mounted into the gearboxes' hollow-bore input shaft and to the End Blocks. The installer must provide a torque reaction bracket at the hole indicated by øH.

NOTE - See catalog page 94 for mounting positions.



Gearmotor and Motor Flange Dimensions

End Block	Gearbox	DB	DF	DG	DL	DM	DW	F	G	H
EB005F	NC12	4.80	6.50	2.95	7.42	6.69	3.11	0.55	3.36	0.43
EB006F					7.48	6.81				
EB008F	NC22	5.79	8.31	3.47	8.01	7.07	3.94	0.63	3.41	0.55
EB009F	NC32	7.01	9.84	4.13	9.91	8.07	4.45	0.71	3.66	
EB010F					10.16	8.33			3.91	

Motor	FP	C	C (Brake)	AB	AB (Brake)
1/6 - 1/4 HP	4.84	7.49	9.69	4.53	4.84
1/3 - 1/2 HP	5.43	9.05	11.34	4.88	5.24
3/4 - 1 HP	6.14	10.04	12.56	5.59	5.63
1.5 - 2 HP	6.92	11.65	14.60	5.79	5.83
3 - 5 HP	7.63	12.83	16.42	6.65	6.26
7.5 - 10 HP	10.16	17.12	21.34	8.03	7.72

Note: Unless otherwise specified all dimensions are in inches.

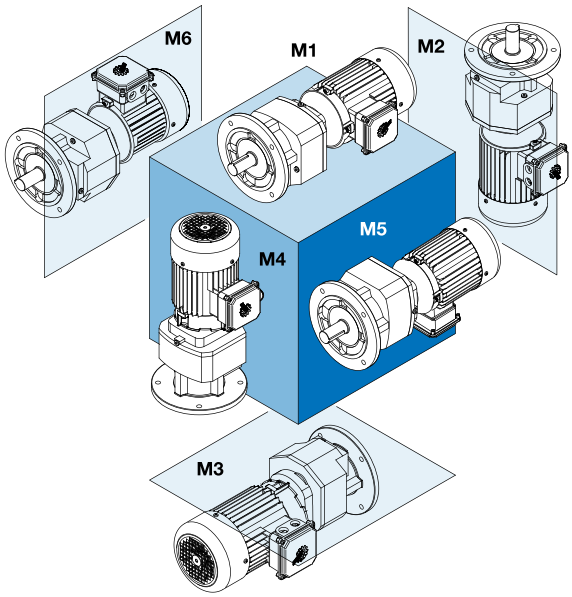
COMPONENTS
MOUNTING POSITIONS

Because our gearmotors use oil lubrication, it is very important for us to know how the gearmotors will be mounted during use. Providing this information to us will ensure that the Level, Vent, and Drain Plugs are located on the gearbox in the position best suited for the application. Please review the provided drawings and give us the corresponding mounting code.

NOTE

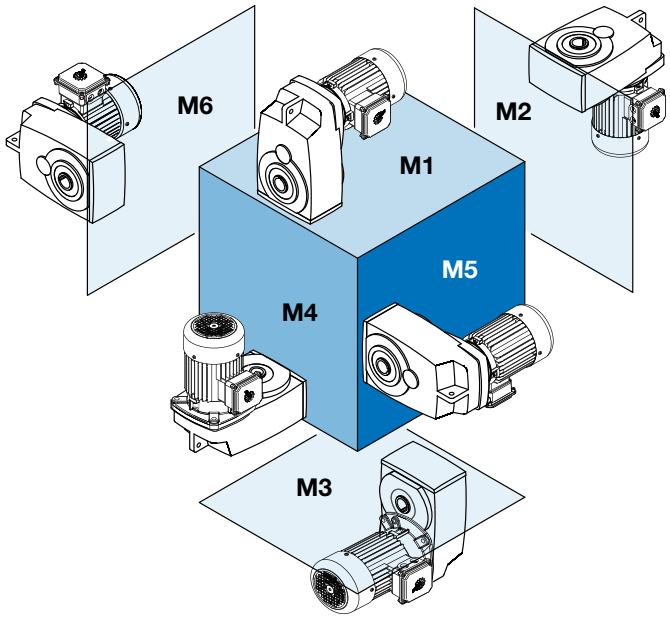
Should the customer fail to provide this information, Duff-Norton will assume the gear box will require our standard mounting configurations shown below.

Gearmotor mounting positions for all screw diameters 1/2" to 1.17"



The Duff-Norton default position code for these sizes is M1.

Gearmotor mounting positions for all screw diameters 1/2" to 1.17"



The Duff-Norton default position code for these sizes is M6.

Hand Wheels and Rotary Counters can be mounted together on the same end to provide the user with instant positioning data. This combination can be used on one or both screw ends.

The Duff-Norton hand wheel is for customers who may require precise positioning, or may have loads which do not require motorized power to adjust.

FEATURES & BENEFITS

- Easy installation to the Fixed End Journal. All Hand Wheels are bored, keyed, and set-screw drilled to the proper dimensions
- Revolving handle design for rotational ease
- Recessed hub and spoke design
- Cast iron material with chrome plating

NOTE

Handwheels do not contain braking systems; therefore an additional locking mechanism to prevent possible backdriving is recommended.

The table below presents dimensional information for all Duff-Norton Hand Wheels. To properly select the best hand wheel for your application, please review the provided information, or contact our customer service team.

Hand Wheel Dimensions and Selection Table

Model Number	Acme Screw & Lead	Ball Screw & Lead	Hand Wheel Only Journal End Size	Hand Wheel & Counter Journal End Size	Dia. (Inch)	Width** (Inch)	Bore Size (In)	Keyway Size (Inch)
HW04-.313	0.5 - All*	0.5 - All*	Type 3A - Drive End Size 00	Type 3RH - Drive End Size 00	4	3-3/8	0.313	1/8 x 1/16
HW04-.406	0.63 - All*, 0.75 - All*	0.63 - All*	Type 3A - Drive End Size 01	Type 3RH - Drive End Size 01			0.406	
HW06-.562	1 - All*	0.75 - All*	Type 3A - Drive End Size 03	Type 3RH - Drive End Size 03	6	4	0.562	
HW06-.625	1 x .100	1, 1.17 - All*	Type 3A - Drive End Size 04	Type 3RH - Drive End Size 04			0.625	3/16 x 3/32
HW06-.875	1.5 x .375	1.5 - All*	Type 3A - Drive End Size 05	Type 3RH - Drive End Size 05			0.875	
HW08-1.00	1.5 - All*	1.5 x 1.875	Type 3A - Drive End Size 06	Type 3RH - Drive End Size 06	8	6-3/16	1.00	1/4 x 1/8

Note: Unless otherwise specified all dimensions are in inches.

* All leads for that diameter screw except where noted *

** From the end of the handle to the end of the hub **

DUFF-NORTON
CONTROL SYSTEMS
PRECISION MOTION TECHNOLOGY

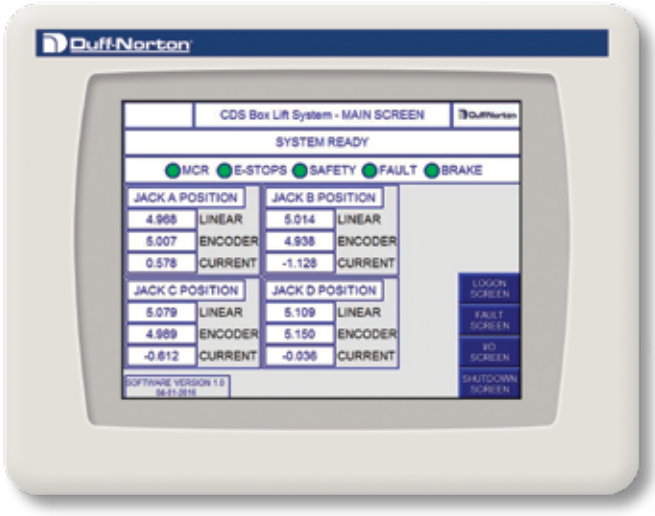
Whether you need a custom turn-key solution, a standalone, or an integration into a legacy system our automated motion control solutions bring together the products and technology that improve your processes and move you into the future through each stage of production.

Why use Duff-Norton Controls?

We are linear motion experts. We know our linear motion products better than anyone and understand the challenges you face – navigating a dynamic marketplace that demands innovative technologies and the agility to contend with a greater need for increased productivity.

Our industrial experience combined with the latest controls technologies and our broad assortment of linear motion products make us the ideal partner to work closely with you to design and implement your system solutions.

We know how to get the highest performance out of our linear motion products. Through our control solutions we can meet the most advanced industrial lifting, positioning, and transfer demands needed to help you gain a competitive advantage in the global marketplace.



FEATURES

Duff-Norton control systems provide

- Fewer interfaces
- Better performance
- One integrated system
- Automated machine cycling
- Scalable hardware and software

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Electric control systems support a wide range of applications

Duff-Norton engineers a wide range of controls systems, and can provide turn-key solutions for applications ranging from jogging controls to complex automated systems. We offer systems from fractional horsepower sizes up to 200 HP.

STANDARD FEATURES

- All Duff-Norton controls are designed to meet UL508A
- NEMA enclosures provided for all applications
- Labeled terminal strip for ease of field connections
- Motor overload protection
- Short circuit protection for all control voltages
- External Main Disconnect Switch (MDS)
- All wires labeled for quick troubleshooting
- Electrical schematics provided for all applications

INDUSTRY EXPERTISE

- Synchronization controls
- Positioning controls
- Variable speed controls
- Jog controls

STANDARD HARDWARE

- PLCs
- HMIs
- VFDs
- SERVOs
- Encoders
- Motor protection
- Linear sensors
- E-stops

BENEFITS

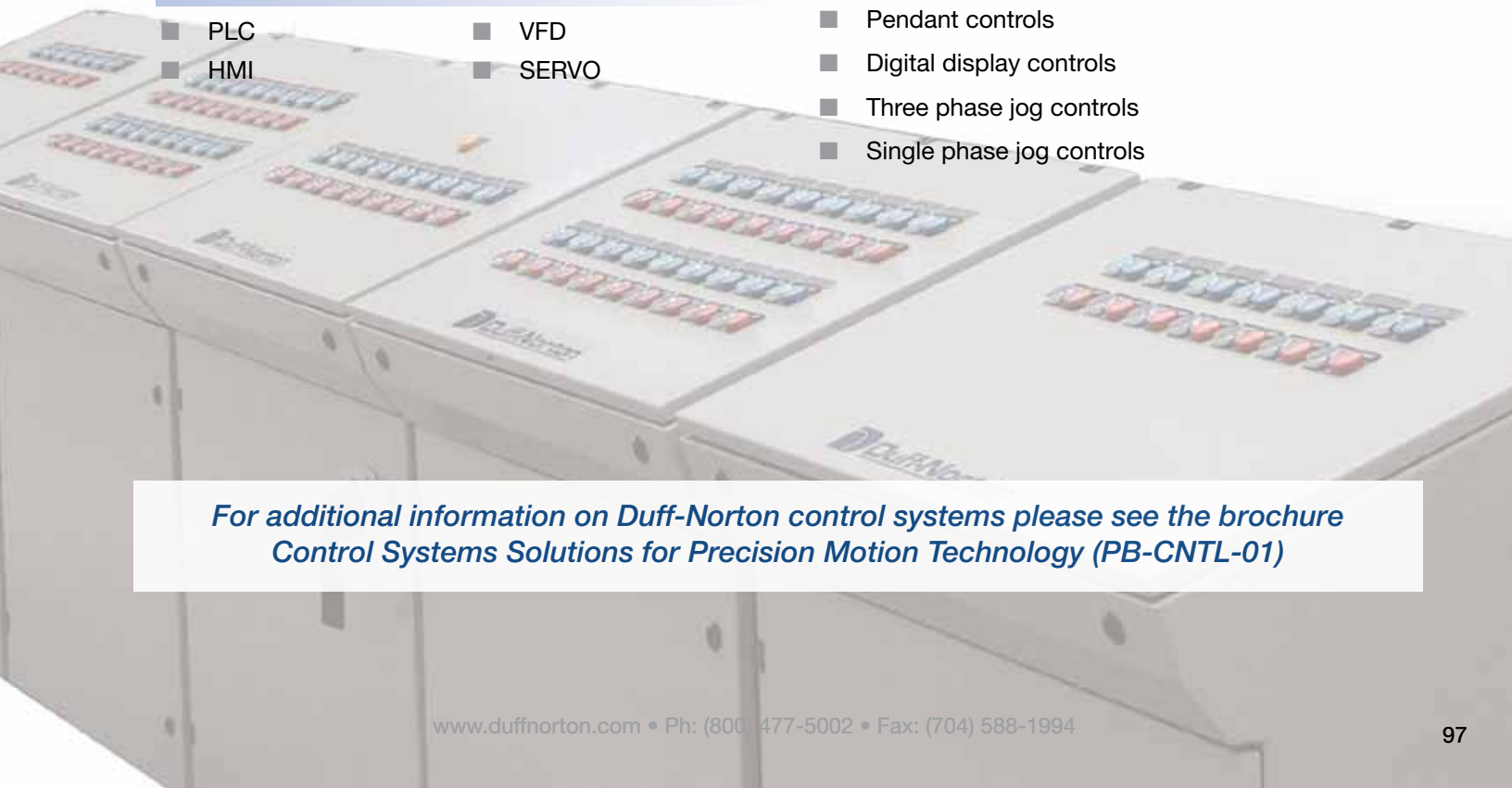
- Fewer interfaces
- Better performance
- One integrated system
- Turn-key solutions
- Reduced downtime
- Increased productivity

STANDARD SOFTWARE PROGRAMMING

- PLC
- HMI
- VFD
- SERVO

AVAILABLE CONTROL SYSTEMS

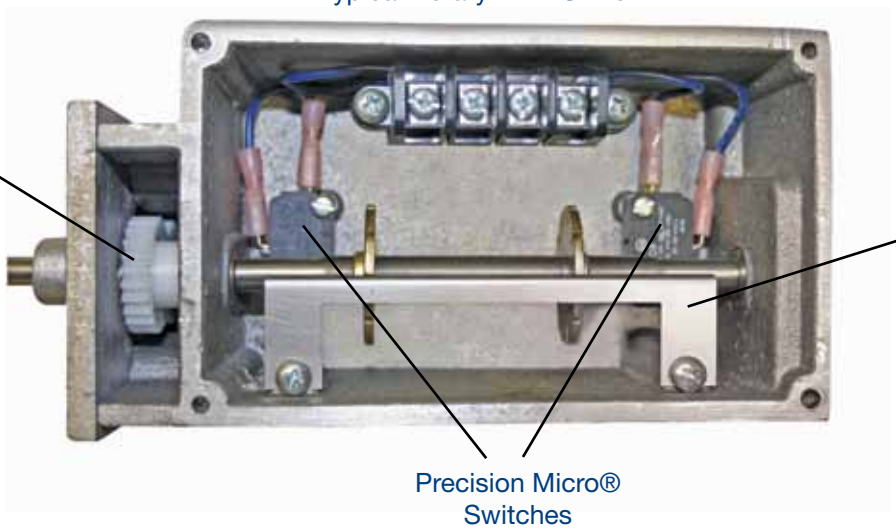
- Custom controls (Duff-Norton control packages can be highly customized to meet your needs)
- Synchronization controls
- Variable speed controls
- Positioning controls
- Pendant controls
- Digital display controls
- Three phase jog controls
- Single phase jog controls



For additional information on Duff-Norton control systems please see the brochure Control Systems Solutions for Precision Motion Technology (PB-CNTL-01)

Rotary Limit Switches

Typical Rotary Limit Switch

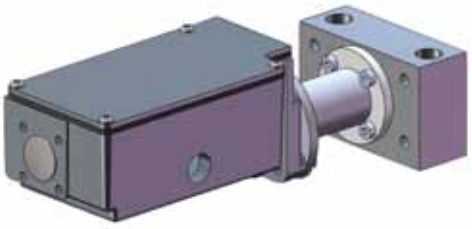


Mounting Configurations

To ensure that limit switch has sufficient travel capability for the acme or ball screw system, use the following formula:

Limit Switch Turns = Length of travel (inches) / Screw Lead

Simple End Block and B6000 Series Limit Switch Right Angle Mounting



Simple End Block and NZ6000 Series Limit Switch In-Line Mounting

FEATURES

- Switches are rated for 15A at 125-277VAC, and 1/4A at 250VDC.
- Three gear ratios to govern even the longest stroke requirements.
- Sturdy and compact. Constructed of corrosion-resistant materials. Meets NEMA-4 water tightness requirements.
- Simple to adjust. Two switches, one for up/stop and one for down/stop, are activated by the adjustable limit-switch nuts which travel laterally when the internal screw is rotated through gear reduction.
- Operating temperature range -20° to + 150°F.
- Lifetime lubricated.
- Both Limit Switch models are available with adapters for mounting to our Simple End Blocks.

NOTE

For water-tight connection, use a weather-tight connector and sealant around threads. Limit switches will be damaged if over traveled. For shipping purposes, the 1/2" NPT hole is closed with a plastic plug which is not water tight.

Rotary Limit Switches

The NZ6000 series switch is appropriate for most applications and is mounted in-line to the screw. The B6000 series switch is required only for long screws with fine pitches (more than 244 turns) and has a right angle gear reduction. B6000 series switches are readily adaptable to End Block sizes EB0003S – EB0006S, and require custom adapters for other block sizes.

Limit Switch Mounting

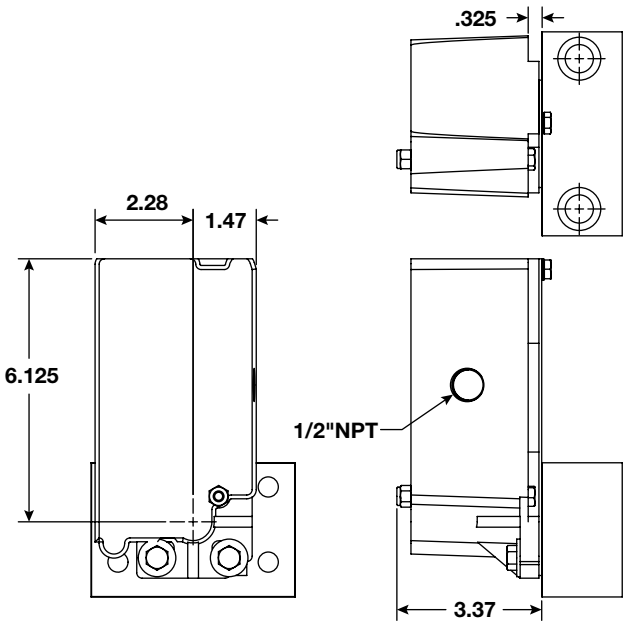
Mounting of a Limit Switch requires that the screw end be modified to provide a switch drive engagement. Specify screw journal end from the following table.

Limit Switch and End Block Dimensions

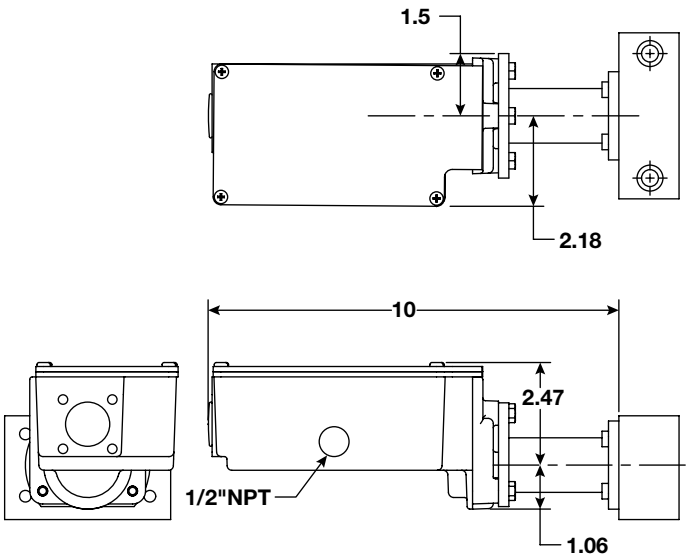
End block must be located so that the 1B screw end is flush with the face of the block. See block dimensions page 67 and page 68 for further installation instructions.

Limit Switch Model	NZ600-1	NZ600-2	B6000A10	B6000A20
Screw Lead	Maximum Stroke per Limit Switch Model (inches)			
0.100	12	24	120	240
0.125	15	30	150	300
0.200	24	48	240	480
0.250	30	61	300	600
0.320	38	78	384	768
0.375	45	91	450	900
0.413	49	100	495	992
0.473	56	115	567	1135
0.500	60	122	600	1200
0.667	80	162	800	1600
0.750	90	183	900	1800
1.000	120	244	1200	2400
1.334	160	325	1600	3200

End Block	Mounting Kits	Screw Journal End
EB000S	EBLS01K	End 1A
EB001S	EBLS01K	End 1ALS
EB003S	EBLS04K	End 1B with L.S. Drill
EB004S	EBLS04K	End 1B with L.S. Drill
EB005S	EBLS06K	End 1B with L.S. Drill
EB006S	EBLS06K	End 1B with L.S. Drill
EB008S	EBLS10K	End 1B with L.S. Drill
EB009S	EBLS10K	End 1B with L.S. Drill
EB010S	EBLS10K	End 1B with L.S. Drill
EB012S	EBLS12K	End 1B with L.S. Drill



Simple End Block and B6000 Series Limit Switch Right Angle Mounting



Simple End Block and NZ6000 Series Limit Switch In-Line Mounting

Potentiometer / Transducer

The Duff-Norton SKA6205 Series Position Feedback Potentiometer/Transducer is designed to mount on the end of any NZ6000 or B6000 Series limit switch. Its active component is a precision potentiometer which may be used as voltage divider to provide a feedback voltage that is proportional to the acme or ball nuts position.

FEATURES

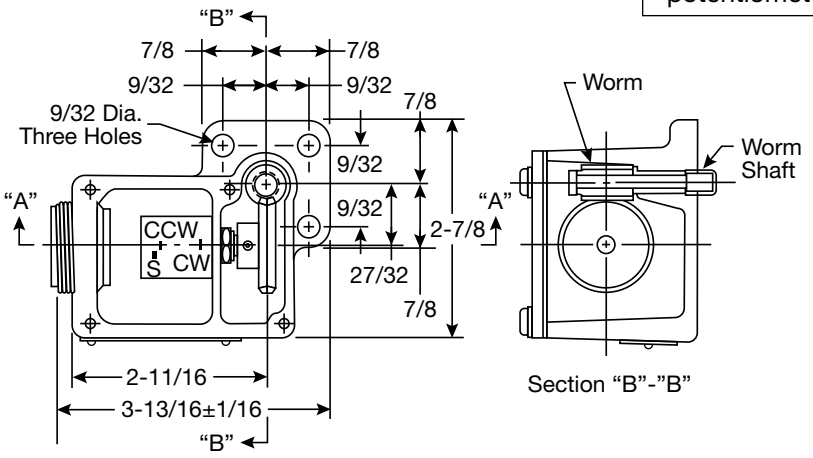
- Multiple gear ratios allow for a wide range of turns.
- Standard resistance is 5000 ohms. Other resistances are available on special order.
- Power rating: 2 watts at 40°C
- Max. service temp.: 85°C
- Interface directly with the Model SK6300-4K Digital Position Indicator to provide a scalable readout of position. The SKA6205 Series can also be used with most motor controls that have provision for potentiometer feedback signal.
- Transducer supplied with black anodized finish as standard.

Model	Max. Turns Poten-tiometer	NZ6000-1	Max. Limit Switch NZ600-2	Turns with Pot B6000A10	B6000A20
SKA6205-30	30	31	64	300	600
SKA6205-50	50	52	106	500	1000
SKA6205-60	60	62	128	600	1200
SKA6205-100	100	104	213	1000	2000
SKA6205-120	120	120	240	1095	2190

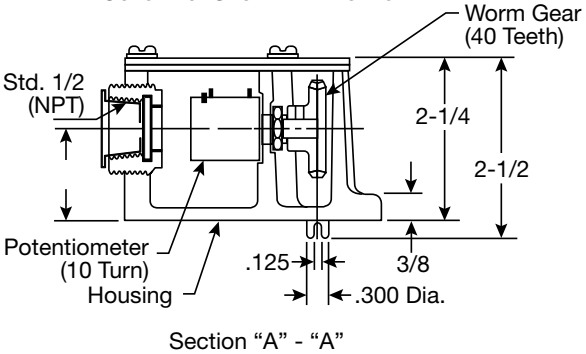
The table shows the turn capability of available pots, mated with limit switches. Choose a combination which most closely exceeds the application requirement.

NOTE

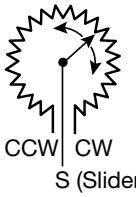
Transducer shipped unattached, to be installed at site. Includes required mounting hardware; soldering to potentiometer required.



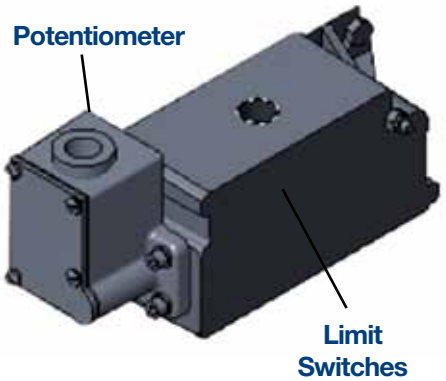
Cover Not Shown In This View



Section "A" - "A"



CCW & CW Refer To Worm Shaft Rotation as Viewed From Slotted End.



Digital Position Indicator for Duff-Norton Potentiometers

The Duff-Norton model SK6300-4K Digital Position Indicator processes a feedback signal from a the SK6200T series potentiometer to provide position readout with user selectable scaling factor. By running the screw and nut system to two positions in its stroke and keying in the desired readout at each point, the indicator automatically scales the input signal to provide linear readout over the full travel. The SK6300-4K has a universal, 85-250 VAC power input and generates a regulated 24 VDC excitation signal to the potentiometer. The SK6300-4K operates seamlessly with any potentiometer equipped Duff-Norton screw and nut system.

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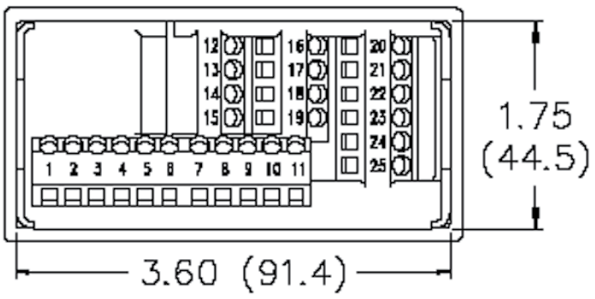
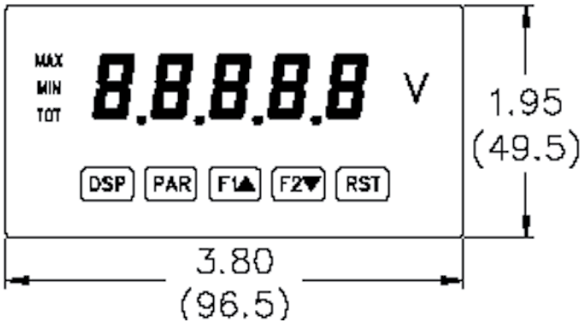
FEATURES

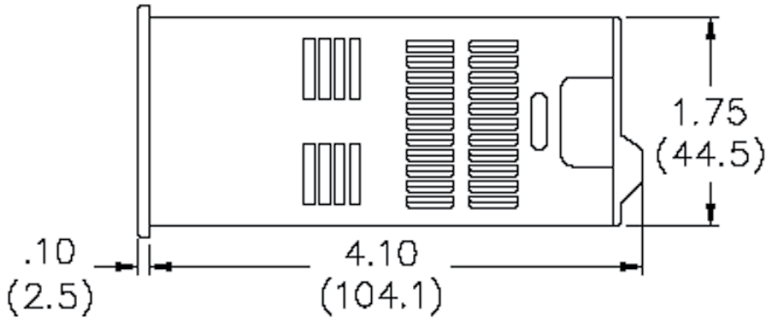
- Self scaling by inputting minimum and maximum readings – either by entering the stroke or input signal
- Accepts 1K to 10K potentiometer inputs
- Programmable decimal point location
- Input power requirement from 85 – 250 VAC
- Programmable front panel functions
- For use with Duff-Norton acme or ball screw and nut systems



NOTE

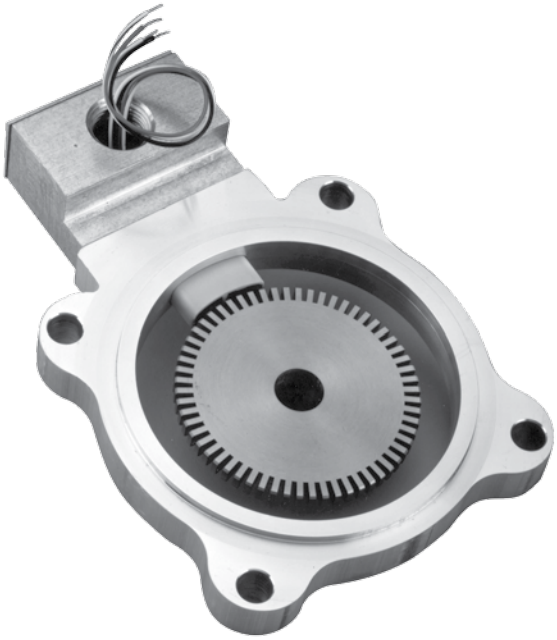
Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4 mm) H x 5.0" (127 mm) W.





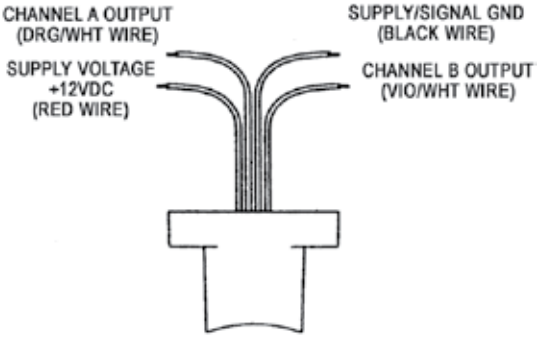
Ring Kit Encoder

The Ring Kit Encoder counts motor revolutions and is mounted between the C-face motor and motor mounting flange. With 60 pulses per motor revolution, the ring kit offers a high pulse count relative to actuator travel. A small junction box with NPT opening is attached to the ring, allowing easy, protected electrical connections. Available for all sizes of NEMA C flanges used on Duff-Norton motorized screw and nut systems. Additional output types available. Contact Duff-Norton Application Engineering for specifics.

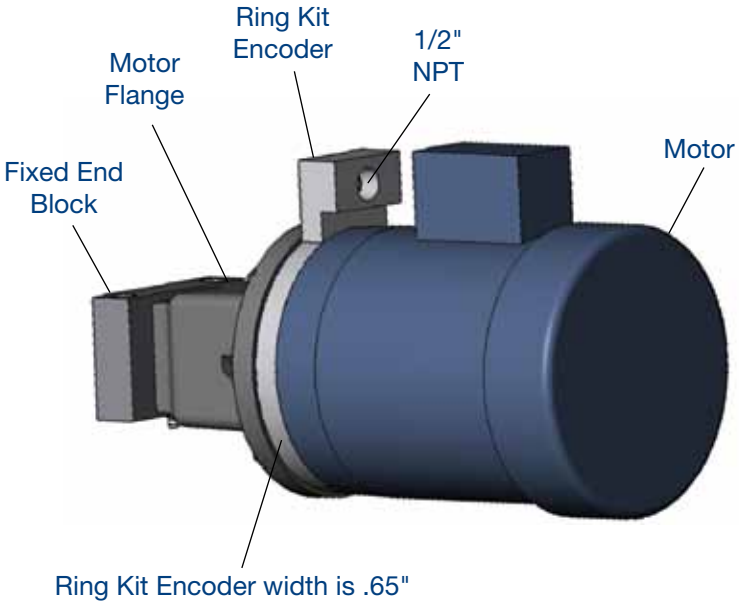


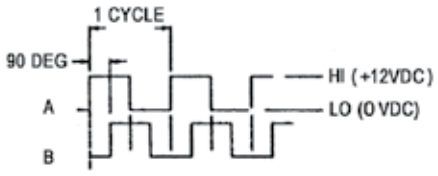
SPECIFICATIONS

Sensor Type	Bidirectional shaft speed sensor
Pulse Per Revolution	60 cycles each channel
Supply Voltage	5-24 Volts DC ±5%
Supply Current	60 mA typical (115 mA max.)
Output Drive Capability	250 mA per channel continuous
Maximum Load	50 ohms per channel
Frame Sizes	56C, 182C

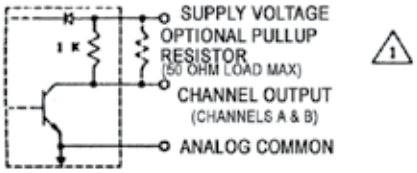


Electrical Connections





Output Channel Waveforms



Output Channel Schematic (Channels A & B)

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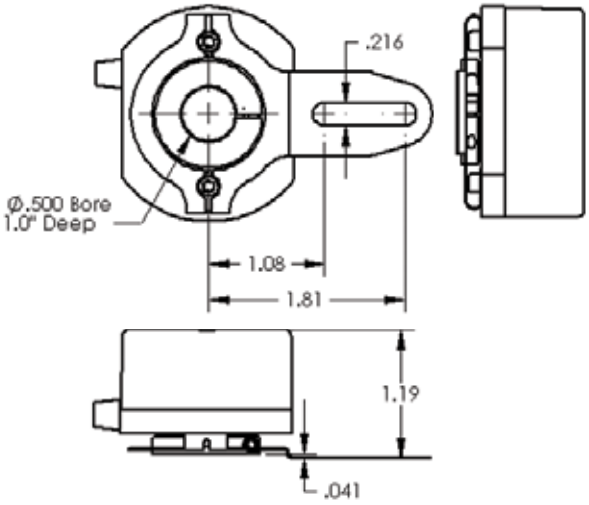
Incremental Encoders

Incremental encoders provide pulses or counts back to a PLC or VFD. A PLC can be programmed to use encoder pulses to sunchronize, position, or vary the speed of an electric motor. They can be mounted on limit switches, reducers, or electric motors and can offer a variety of different pulses per revolution (PPR). Incremental encoders can provide as little as one pulse per revolution up to several thousand pulses per revolution.



FEATURES

- Up to 10000 pulses per revolution (60 ppr standard)
- Input voltage 4.75 to +28VDC
- Operating temperature (-0° to +70°C)
- M12 cable connector or prewired cable options

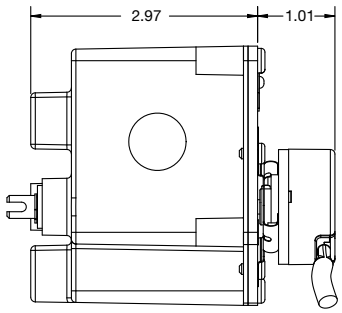
Absolute Encoders

Absolute encoders work similarly to incremental encoders. Pulses or counts are monitored by a PLC or VFD. Ethernet/IP encoders communicate with a PLC over an Ethernet cable. Unlike incremental encoders, abosolute encoders retain position through a power cycle. There is no need to reference or home absolute encoders after a power cycle.

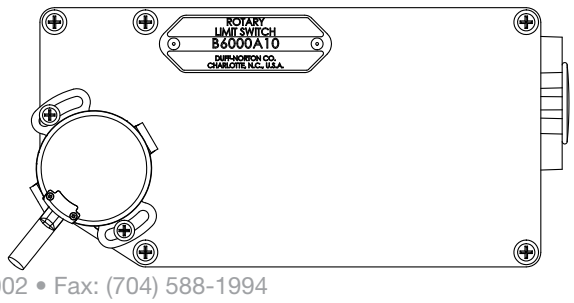
Ethernet/IP Absolute Encoder

Mounted Encoders

Try this new innovation from Duff-Norton! Customers can now choose to expand their controls capabilities with encoders mounted on our Duff-Norton B Series limit switches.



Mounted Encoder



Safety Nuts

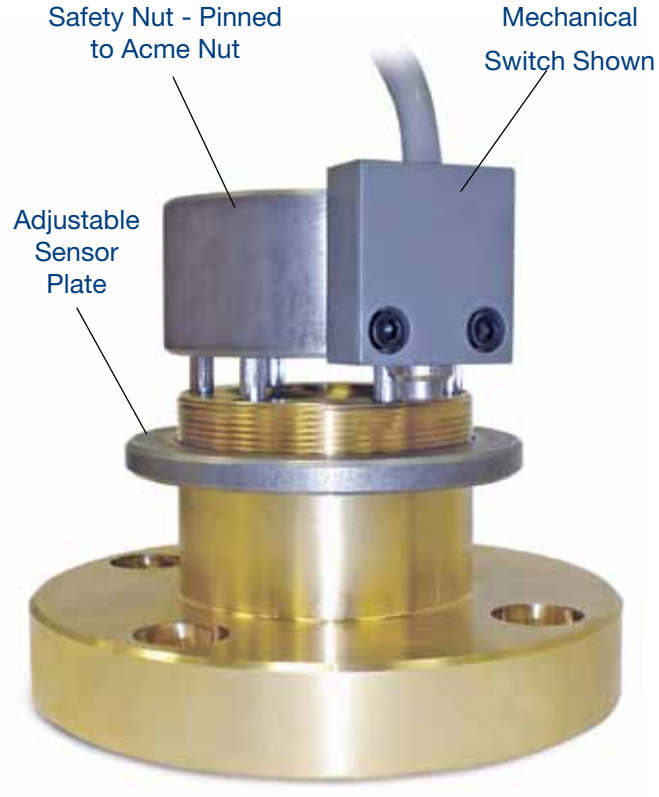
The Duff-Norton safety nut is highly recommended for vertical applications where the load must be maintained. The safety nut is pinned to the acme or ball nut and can be supplied with either a mounted proximity switch or mechanical switch.

Proximity Safety Nuts - The desired distance between the safety nut and acme or ball nut is established during installation. When the acme nut threads or ball nut bearing balls begin to wear, the distance between the acme and/or ball nut and the safety nut changes and the proximity switch sends a warning signal to the system controls.

Mechanical Safety Nuts – This system uses a mechanical switch mounted to the safety nut. The system is installed with the mechanical switch in a compressed or uncompressed state. When the acme or ball nut begins to wear the distance between the safety and acme or ball nut increases and the mechanical switch compresses or decompresses which sends a warning signal to the system controls.

Safety nuts are available for most screw sizes. Safety Nut installation can be to either end of the acme nut, and to the flange end of a ball nut.

Safety Nut threads are machined to a slightly larger tolerance than are the acme or ball nut threads. This larger tolerance allows the acme or ball nut to rotate freely around its respective screw with the safety nut still performing its function.



Mechanical or Proximity Switches can be used. Sensor plate may not be needed in some designs.

Acme and Ball systems are available for many applications.

Safety nut can be machined to accommodate a customer supplied switch.

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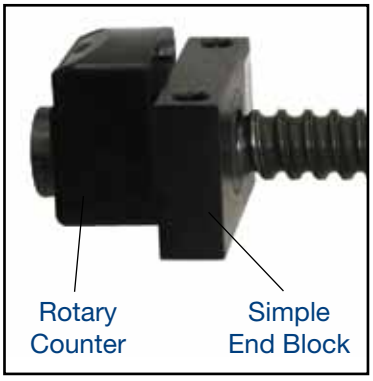
Rotary Counters

The Duff-Norton Rotary Counter is for customers who are looking for an easy way to determine an acme or ball nut's position along the screw. Our counter ratios have been designed to match the most common screw leads. An operator viewing the reading in the display window will know the nut's approximate position because the counter's display shows stroke to the nearest thousandths of an inch up to 99 inches of travel. Custom numeric displays are also available.



Note: Rotary Counters and Hand Wheels can be mounted on the same screw end. See page 78 for details.

FEATURES

Some of the more important features are:

- Display readings have been pre-matched to the screw lead.
- Display reading has been extended to the nearest thousandths of an inch.
- Clockwise and counterclockwise models available.
- Easy mounting kits available.

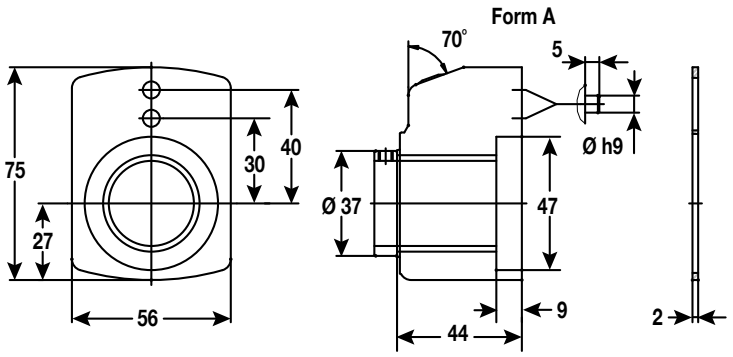
Performance Specifications

Model Number	Turns Per Inch	Acme & Ball Screw Leads (Inch)
Clockwise Rotation		
RC01R	1	1.00
RC02R	2	.500
RC04R	4	.250
RC05R	5	.200
RC10R	10	.100
Counter Clockwise Rotation		
RC01L	1	1.00
RC02L	2	.500
RC04L	4	.250
RC05L	5	.200
RC10L	10	.100

Contact customer service for screw leads which are not even T.P.I.

Rotary Counters - Mounting Information

The Duff-Norton Rotary Counter fits over one of the screws Journal Ends with drive extension. A special bushing fills dimensional difference between the counter's bore and the journal ends drive diameter (see table). The user should make provisions to provide some mechanism to prevent the counter from rotating along the screw's shaft.



Installation Information

Bushing Number	Acme Screw & Lead	Ball Screw & Lead	Journal End Size
BU10-.313	0.5 - All*	0.5 - All*	Type 1A - Drive End Size 00
BU10-.406	0.63 - All*, 0.75 - All*	0.63 - All*	Type 1A - Drive End Size 01
BU10-.562	1 - All*	0.75 - All*	Type 1A - Drive End Size 03
BU10-.625	1 x .100	1 - All*	Type 1A - Drive End Size 04
BU10-.875	—	1.5 - All*	Type 1A - Drive End Size 05
BU10-1.00	1.5 - All*	—	Type 1A - Drive End Size 06

*All leads for that diameter screw except where noted.

Typical System Arrangements

Duff-Norton offers all of the components necessary to complete your linear motion system, whether it consists of a single actuator or multiple screw and nut arrangements. We offer a complete line of accessories to interconnect two or more screw and nut systems and provide permanent synchronization. Duff-Norton's Application Engineers can specify shafts, couplings, end blocks, pillow blocks, and right-angle miter gearboxes to accommodate any layout. Bellows boots to protect screws from dirt and other contaminates are available for all systems, to increase life and reduce maintenance requirements.

The following pages outline the basic selection of power transmission components that can be utilized to assemble a system. The tables match the parts to their respective actuator sizes to assist selection.

By letting Duff-Norton be your sole source for actuator system components, you can consolidate your needs on one purchase order, reducing time spent sourcing, pricing, and receiving parts. Should you have questions, contact our customer service representatives. Duff-Norton's extensive experience with linear motion can provide you with suggestions for the most economical and reliable application solutions.

1.

2.

3.

4.

Mitre Boxes

Screw and nut systems can use multiple arrangements. Such systems could use mitre boxes to effectively position and equally distribute loads. As the mitre boxes are supplied with 1:1 gear ratios as standard, all motion is synchronous upon system actuation through the main drive shaft.

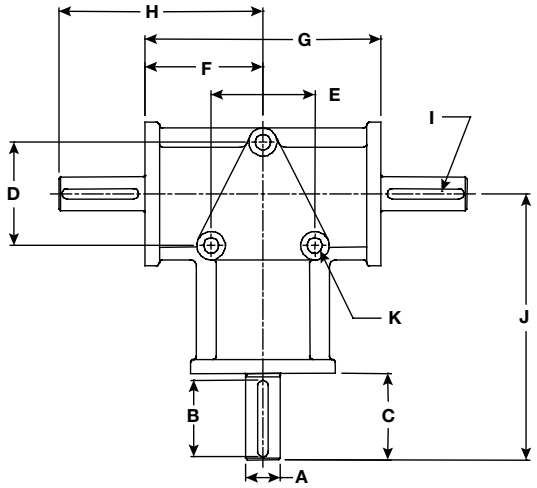
Our mitre boxes feature a compact design, which eliminates the need for an extended hub. With this design feature the bevel gear is supported by tapered roller bearings on both sides. The result is a higher horsepower rating, increased service-life, improved lubrication, and more flexible mounting compared to other brands.

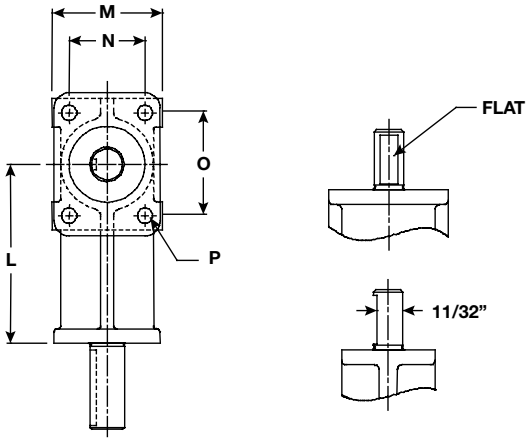
FEATURES

- 98% average efficiency ratings
- Carburized and case hardened bevel gears
- Alloy steel input/output shafts for greater strength
- Anti-friction bearings on all shafts
- MB-4 and MB-8 models come with lifetime lubrication, stainless steel shafts and aluminum housings

Mitre Box Performance Specifications

Part Number	Type	Capacity (Inch/lbs)	Shaft Diameter (In)
MB-4	3-Way	23	.375
MB-8	3-Way	97	.75
MB-16	3-Way	344	.625
MB-19	3-Way	1400	1.0
MB-19G	4-Way	1400	1.0
MB-20	3-Way	3000	1.25
MB-20G	4-Way	3000	1.25
MB-22	3-Way	5000	1.375
MB-22G	4-Way	5000	1.375





Mitre Box Dimensional Specifications

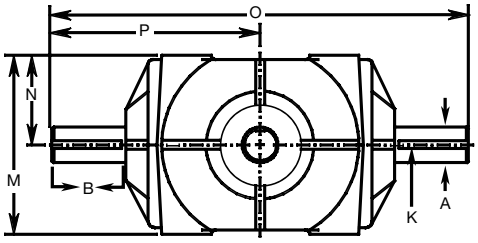
Model	Torque	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MB-4	23	0.375	0.625	0.781	1.938	1.938	1.375	2.75	2.156	FLAT	2.938	0.219	2.156	1.25	0.875	1.188	0.188
MB-8	97	0.75	1.375	1.563	3	3	3	6	4.563	3/16	6.563	0.375	5	3	2.225	3	0.375

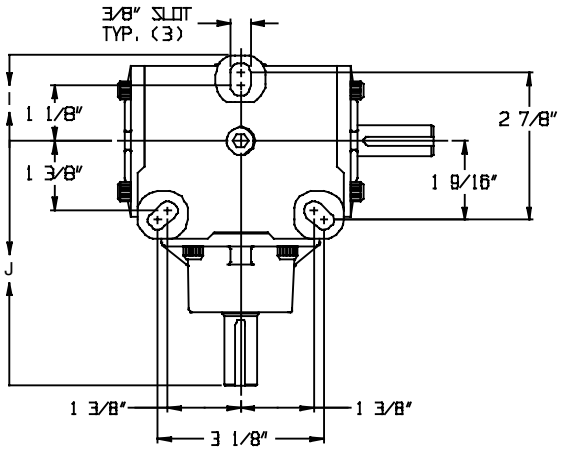
Note: Shaft extensions can be keyed or flat

Mitre Box Dimensional Specifications

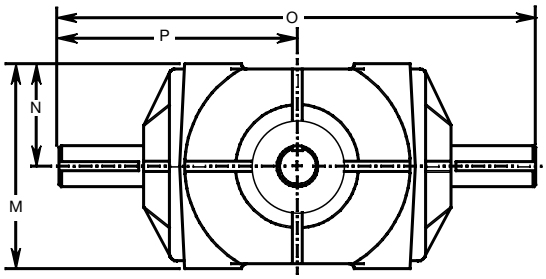
Model	Torque	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MB-16	344	0.625	1.219	1.375	—	—	—	—	—	1.688	4.875	3/16"	—	3.188	1.594	7.25	3.625

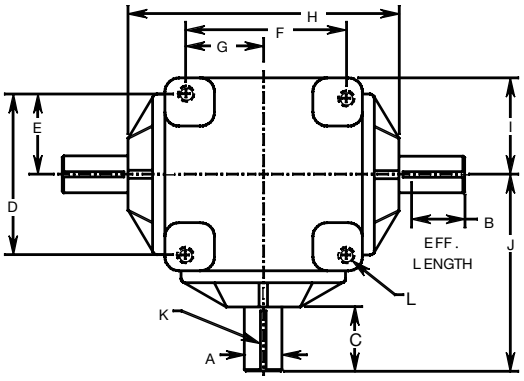
Note: Standard model is a 3-way configuration. B: Effective keyway length.





Model	Torque	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MB-19 (G)	1400	1	1.396	2	4.25	2.125	4.25	2.125	7	2.75	5.5	1/4"	3/8"-16	4.125	2.062	11	5.5
MB-20 (G)	3000	1.25	1.84	2.5	4.5	2.25	4.5	2.25	8	2.875	6.5	1/4"	1/2"-13	5.625	2.813	13	6.5
MB-21 (G)	5000	1.375	2.17	2.938	6	3	6	3	10.625	4.125	8.25	5/16"	1/2"-13	7.5	3.75	16.5	8.25

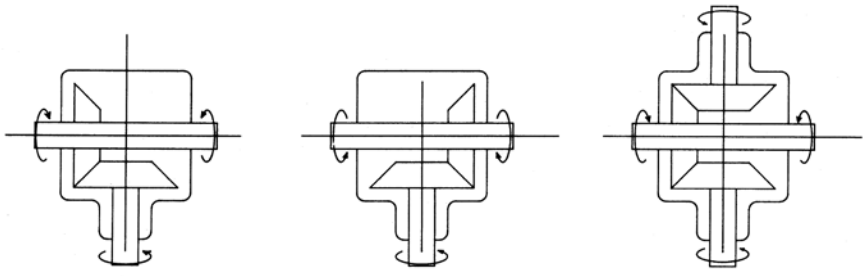




Mitre Box Shaft Rotation

The direction of rotation of a connecting shaft can be controlled either by selecting clockwise or counter-clockwise mitre box rotation. The sketches above show how either a C.W. or C.C.W. rotation is obtained. Both of the depicted 3-way boxes are identical except for the position of the mitre gear on the drive shaft.

The C.W. rotation is most common on both the 3-way and 4-way configurations and is the standard rotation for all Duff-Norton mitre boxes. For more information regarding mitre box shaft rotation please contact our customer service team.



System Couplings

Duff-Norton provides three coupling types which have been tailored to specific screw and nut system requirements:

Coupling with Cover

FEATURES

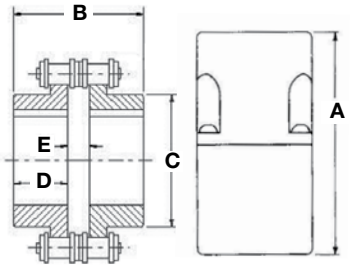
Chain Coupling:

- Integrate well with Duff-Norton mid and larger diameter screw and nut systems
- High torque capacities
- Standard ANSI dimensions, straight bore diameters
- Common bore diameters readily available
- Special bore diameters may be custom ordered
- Long service lives
- Easy fit onto the screw's end
- Allows for incremental system adjustments

Part Number	Std. Bore***	Max. Bore (Inch)	Key Broach Dimensions (In)	A* (In)	B (In)	C (In)	D (In)	E (In)	Coupling Torque	Misalignment (Max)	
										Parallel	Angular
CP03-500500	.500	.875	.125 x .63	4.00	2.53	1.41	1.13	.28	1354	.015	1/2 deg.
CP03-625625	.625	.875	.125 x .63	4.00	2.53	1.41	1.13	.28	1354	.015	1/2 deg.
CP05-750750	.750	.875	.1875 x .093	4.00	2.53	1.41	1.13	.28	1354	.015	1/2 deg.
CP20-10001000	1.000	1.687	.25 x .125	5.13	3.25	2.50	1.44	.38	4614	.015	1/2 deg.
CP35-13751375	1.375	2.000	.313 x .156	5.13	3.75	2.97	1.69	.38	5969	.015	1/2 deg.
CP50-15001500	1.500	2.437	.375 x .1875	6.38	4.23	3.50	1.88	.47	10899	.015	1/2 deg.

* Includes two hubs, four rubber gaskets, chain, and cover *** Tolerance for all bores is +.001/-.000

NOTE: Duff-Norton recommends using the cover assembly with the chain coupling



Coupling Cover

Coupling Selection Guide:

1. Flexible couplings are made up of components: two hubs each with a bore and keyway to match the shafts being coupled and a chain cover (for chain couplings) or a sleeve kit (for gear-type couplings) or a spider (for jaw-type couplings). The bores in the coupling hubs are sized to give an easy fit on screw's end.
2. Determine required coupling torque with this formula:

   Torque Requirement per Screw System X Number of Screws to Be Driven by the Coupling
3. Verify the required coupling torque. Make sure it's not greater than the maximum rating in the accompanying coupling tables.
4. Chain or full-flex gear couplings are recommended for close coupled arrangements.
5. Chain or flex-rigid gear couplings are recommended for floating shaft arrangements with the rigid hub (if selected) mounted to the floating shaft.
6. For maximum performance, the screws, shafts, gear boxes and motor should be carefully aligned.

Jaw Coupling Specifications

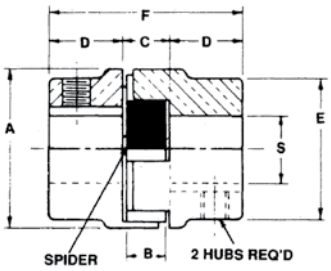
Part Number		Standard Bore*** (In)	Maximum Bore (In)	Key Broach Dimensions (In.)	A*	B	C	D	E	F	Coupling Torque	Misalignment Max.	
Hub No.	Spider No.											Parallel	Angular
SK2555H2	SK2555-29S	.375	.875	None	1-5/64	7/16	15/32	5/8	1-5/34	1-23/32	50	.015	1/2 deg.
SK2402J-H1	SK2402-JS	.501	1.687	.125 x .63	1-3/4	15/32	1/2	13/16	1-3/4	2-1/8	250		
SK2402J-H2	SK2402-JS	.626		.1875 x .0938									

* Includes two hubs, and Hytrel spider ** Based on screw's dynamic torque requirements *** Tolerance for all bores is +.001/-.000

FEATURES

Jaw Coupling:

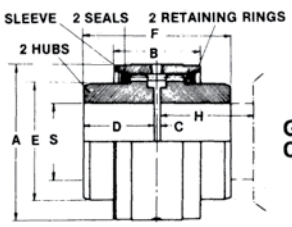
- Integrate well with Duff-Norton smaller diameter screw and nut systems
- Do not require lubrication
- Our Hytrel® spiders provide 2 times the torque capability vs. a standard urethane or BUNA® spider
- Easy fit onto the screw's end
- Other sizes for our standard journal ends are available



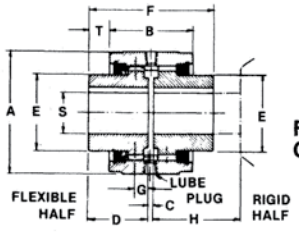
Gear Coupling Performance Specifications

Part Number			Standard Bore***	Key Broach Dimensions	A*	B	C	D	E	F	H	Coupling Torque	Misalignment Max.	
Sleeve Kit	Flex Hub	Rigid Hub											Parallel	Angular
SK2405S	SK2405H	SK2404H	.0751	.1875 x .0938	3-5/16	2	1/8	1-1/2	2	3-1/8	2-1/8	6300	+	1/2 deg.
SK2410S	SK2410H	SK2409H	1.001	.25 x .125										
SK2425S	SK2425H	SK2424H	1.376	.313 x .156	3-3/4	2-17/32		1-13/16	2-3/8	3-3/4	2-21/32	18900		
SK2450S	SK2450H	SK2449H	1.501	.375 x .1875										
SK2499S	SK2499H	SK2498H	1.751	.50 x .25	4-3/4	2-9/16		2-1/16	3-1/4	4-1/4	2-11/16	50000		

* Includes two hubs, gaskets, and sleeve ** Based on screw's dynamic torque requirements *** Tolerance for all bores is +.001/-.000



Gear Coupling



Flex—Rigid Coupling

FEATURES

Full-Flex and Flex-Rigid Gear Couplings:

- Give great strength under load due to compact design and construction.
- Allow for incremental system adjustment.

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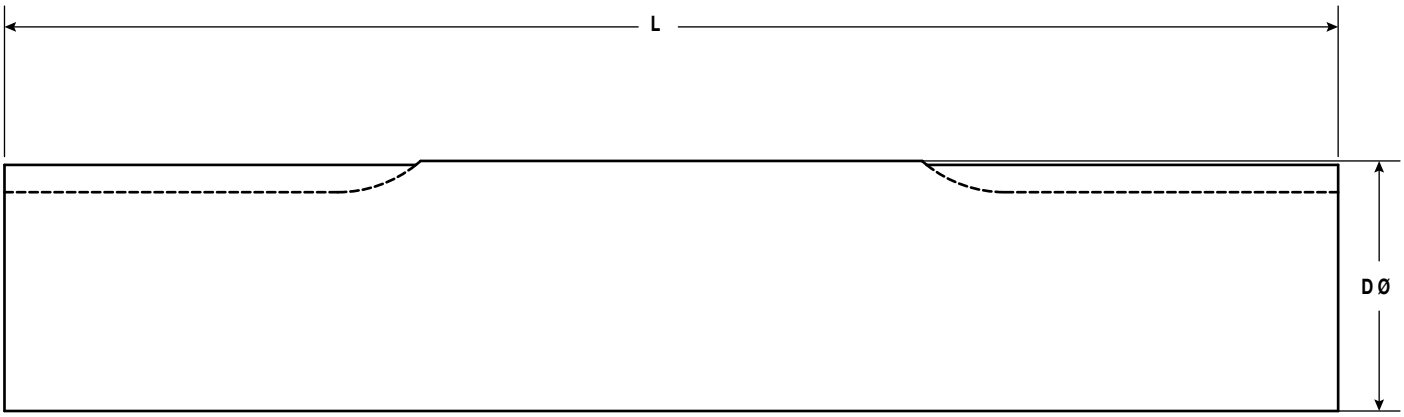
Connecting Shafts

Problem Scenario – A common system operating problem stems from connecting shafts made from standard steel, which are often bowed or out-of-round. This results in a whipping effect while the system is being run with the connecting shaft working its way loose form the system at high speeds and doing a great deal of damage to the system's equipment.

Solution – Duff-Norton connecting shafts, which are furnished with close tolerance Turned, Ground, and Polished steel for smooth rotation

FEATURES

- Turned, Ground, and Polished steel
- Shaft material is machined from cold-drawn bar
- Furnished with ANSI-standard in-line keyways



Dimensions and Minimum Size

Model		SH50	SH63	SH75	SH100	SH125	SH150	SH163	SH175	SH200	SH225	SH250
Minimum Shaft Length* "L" (Inch)		5	5	5	5	6	7	7	7	8	10	10
Shaft Diameter "D" (Inch)	Nominal	1/2	5/8	3/4	1	1-1/4	1-1/2	1-5/8	1-3/4	2	2-1/4	2-1/2
	Actual	0.500	0.625	0.750	1.000	1.250	1.500	1.625	1.750	2.000	2.250	2.500
		0.499	0.624	0.749	0.999	1.249	1.499	1.624	1.749	1.999	2.247	2.497
Keyway Width (Inch)		1/8	3/16	3/16	1/4	1/4	3/8	3/8	3/8	1/2	1/2	5/8
Keyway Flat (Inch)		1.25	1.25	1.25	1.25	1.5	1.75	1.75	2	2	2.5	2.5

Note: Minimum shaft length may vary depending on the specified coupling.

Shaft Selection Criteria

Instructions:

1. Find a torque value that is greater than or equal to your calculated torque requirements.
2. Use the second column to find the required shaft diameter (rounding up is recommended.)
3. Check the third column for the maximum allowable shaft span before supports are required.
4. Match your selected shaft's maximum allowable speed (rpm) to actual shaft speed (rpm). Increasing your selected shaft size is recommended until it falls into the allowable range.

Shaft Diameter (Inches)	Maximum Torque (in/lbs)	Maximum** Distance Between Supports (inches)	For Shaft Lengths below, Maximum Allowable RPMs***									
			36	48	60	72	84	96	108	120	132	144
0.500	9	68	1469	826	529	367	270	207	163	132	109	92
0.625	22	79	1836	1033	661	459	337	258	204	165	137	115
0.750	45	89	2204	1240	793	551	405	310	245	198	164	138
1.000	141	107	2938	1653	1058	735	540	413	326	264	219	184
1.250	345	125	3673	2066	1322	918	675	516	408	331	273	230
1.500	716	141	4407	2479	1587	1102	810	620	490	397	328	275
1.625	986	148	4775	2686	1719	1194	877	671	531	430	355	298
1.750	1326	156	5142	2892	1851	1285	944	723	571	463	382	321
2.000	2262	170	5877	3306	2116	1469	1079	826	653	529	437	367
2.250	3624	184	6611	3719	2380	1653	1214	930	735	595	492	413
2.500	5523	198	7346	4132	2644	1836	1349	1033	816	661	546	459

* Based on .08 degrees per foot torsional deflection.

** Based on .010 in/ft maximum sag between bearings. Shaded area exceeds sag recommendation.

*** Based on 80% critical speed, simple supports

Reference: Machinery's Handbood, 23rd edition.

Maxumum Torque:
$D=.29(T)^{1/4}$ $T=(D/.29)^4$

Bearing Distance:
$L(ft.)=8.95(D^2)^{1/3}$ $L(in.)=107.4(D^2)^{1/3}$

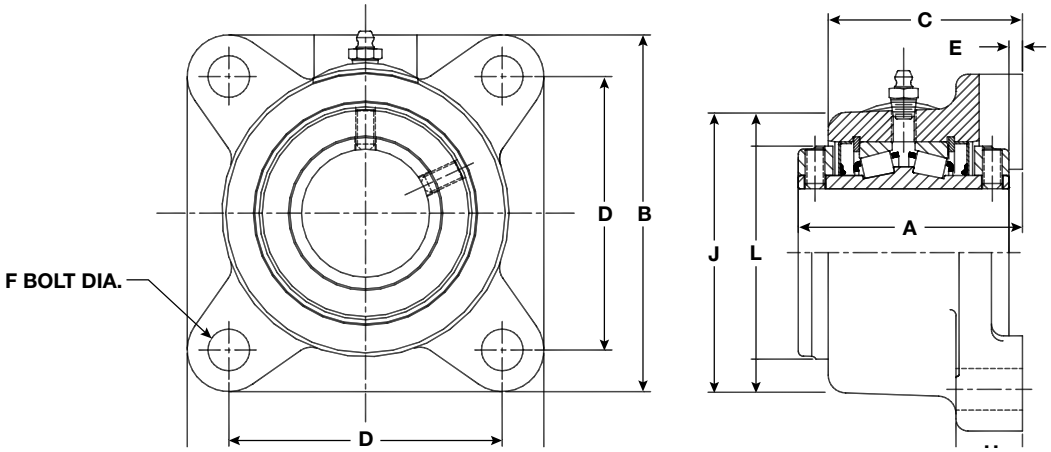
Critical Speed, Shaft Only, Simple Supports:
$N=1.0 \times 4.76\times10^6 \times D/L^2$

Flange Block

Duff-Norton provides a wide assortment of Flange Blocks designed to operate with our screw and nut systems. Flange Blocks lock on to the end of the screw, and can then be bolted on to the machine or fixture. This simple screw support ensures that the load being carried by the acme or ball nut is properly guided.

FEATURES

- Double row tapered roller bearings.
- ASTM A48 Class 30 Iron with tensile strength of at least 30,000 psi.
- Dust seals.
- Set-screw locks – to properly secure screws or shafts regardless of rotation direction.



Flange Block Dimensional Specifications

Screw Diameter	Duff Part Number	Shaft Size (In)	No. Base Holes	A	B	C	D	E	F Bolt Dia.	H	J	L	Weight
3.00	FB250	2.50	4	4	6-7/8	3-9/16	5-3/8	3/16	5/8	1-1/2	5-5/16	4-1/16	19
3.75	FB300	3.00		4-1/2	7-3/4	3-15/16	6		3/4	1-5/8	6	4-23/32	26
4.00	FB325	3.25		5	9-1/4	4-1/2	7	1/4		1-7/8	7-1/4	5-1/2	51
4.50	FB350	3.50											50
5.00	FB400	4.00		6-1/4	10-1/4	5-5/8	7-3/4		7/8	2-1/8	8-1/4	6	75

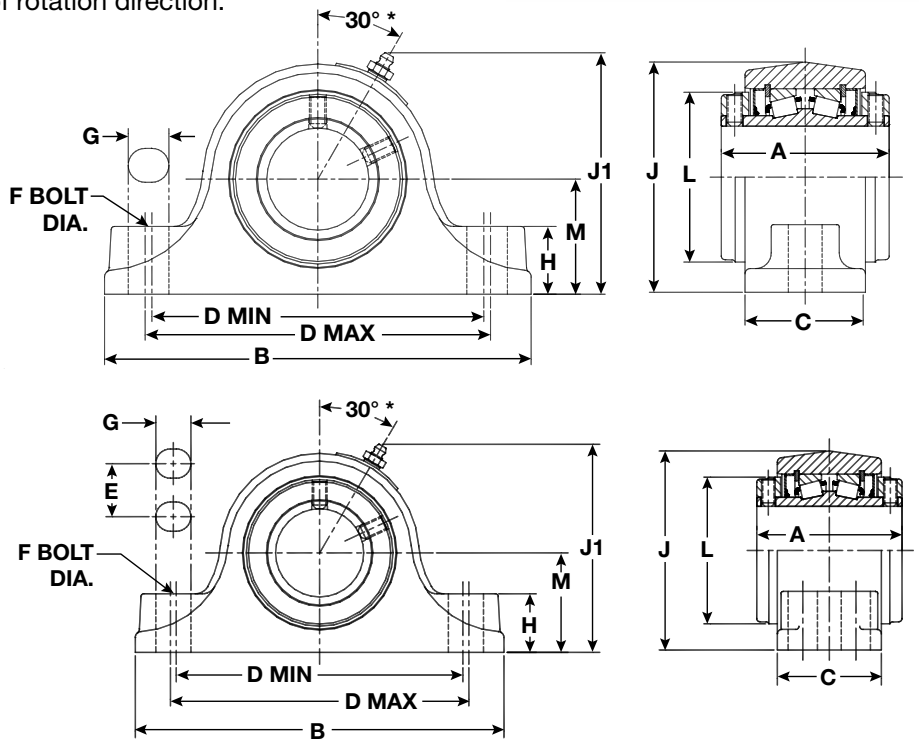
Note: Flange blocks are suited to function as Simple End supports only, not as thrust load bearings. All sizes use a 1/8-27 NPT hydraulic grease fitting.

Pillow Blocks

Duff-Norton provides a wide assortment of Pillow Blocks designed to operate with our screws and nuts, shafts, and couplings meeting a wide range of system requirements. Pillow Blocks may be used in any shafting configuration for additional shaft support, but are specifically required when the shaft length exceeds the dimensions listed in our shaft selection tables.

FEATURES

- Double row tapered roller bearings.
- ASTM A48 Class 30 Iron with tensile strength of at least 30,000 psi.
- Dust seals.
- Set-screw locks – to properly secure screws or shafts regardless of rotation direction.



Pillow Block Dimensional Specifications

Screw Dia.	Part No.	Shaft Size (In)	# Base Holes	A	B	C*	D		E	F Bolt Dia.	G	H	J	J1	L	M	Weight
							Min.	Max.									
3.00	PB250	2-1/2	2	4	10-1/2	2-7/8	8-3/8	8-5/8	N/A	5/8	7/8	1-5/8	5-1/2	5-5/8	4-1/16	2-3/4	20 lbs.
3.75	PB300	3		4-1/2	12	3	9-5/16	9-11/16		3/4	1	1-7/8	6-1/4	6-11/32	4-23/32	3-1/8	27 lbs.
4.00	PB325	3-1/4		5	14	3-1/2	10-13/16	11-13/16		7/8	1-3/16	2-1/4	7-1/2	7-1/2	5-1/2	3-3/4	47 lbs.
4.50	PB350	3-1/2															45 lbs.
5.00	PB400	4	4	6-1/4	15-1/4	4-1/2	12-1/4	12-3/4	2-1/4	3/4	1-1/8	2-7/16	8-7/16	8-1/2	6	4-1/4	69 lbs.
6.00	PB500	5		7-1/4	18-1/2	5-1/8	15-1/4	15-3/4	2-7/8	7/8	1-1/4	3	10-11/16	10-7/8	7-29/64	5-1/2	133 lbs.
7.00	PB600	6		9	22	6-1/4	17-3/8	19-1/8	3-3/4	1	2	3-1/4	—	13-3/16	9-3/8	6-11/16	245 lbs.
9.00	PB700	7		10-1/2	26	7-1/8	21-1/4	23-1/4	4-5/8			3-11/16		14-15/16	11-3/8	7-1/2	335 lbs.

Note: Pillow blocks are suited to function as Simple End supports only, not as thrust load bearings. All sizes use a 1/8-27 NPT hydraulic grease fitting.

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Bellows Boots

Duff-Norton highly recommends the use of a bellows boot for most screw & nut applications. Duff-Norton can provide bellows boots for the most stringent application requirement.

2 boots, one on either side of the acme or ball nut are recommended for most applications. Either a collar or flange end can be supplied can be supplied as needed.

Adjustable hose clamps are provided to secure the boots to the nut.

FEATURES

Some of the more important features are:

- New compact O.D. to I.D. dimensions
- Protects the lifting screw from: dust, dirt, moisture.
- Standard bellows boots are made of 33NN neoprene coated nylon with sewn construction, and are thicker than most boots provided by other sources.
- Special bellows boots can be provided with a variety of materials for applications:
  - High temperatures,
  - Corrosive atmospheres
  - UV / Outdoor environments
  - Bacteria resistance
- Bellows boots can also be provided with internal or external guides to prevent sagging, and with zippers for easy installation or removal.
- Flange End boots are provided with an aluminum back-up plate of the same OD to ensure secure mounting.
- Helps maintain the proper lubrication.

Application Example:

To accurately determine the ratio for expanded boot length versus compressed boot length follow this example:

Expanded sleeve boot length – 2 ft.
Compressed sleeve boot length – 3/4" per foot
Total compressed sleeve boot length is 1 1/2 inches

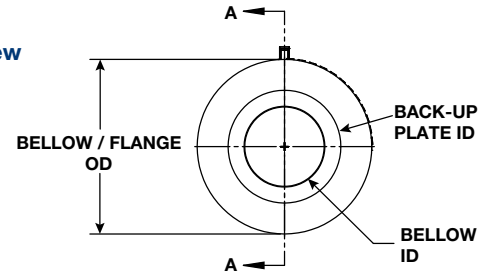
Expanded zipper boot length – 2 ft.
Compressed zipper boot length – 2" per foot
Total compressed sleeve boot length is 4 inches

Duff-Norton sleeve and zipper boots are sold in standard 1 ft. increments

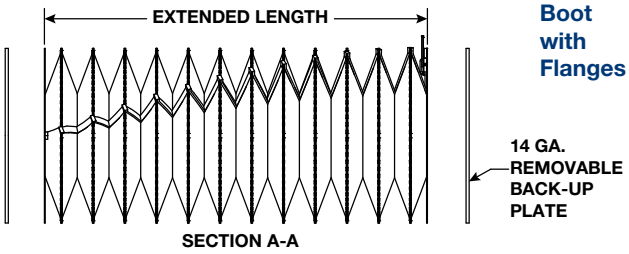
Acme Screw & Nut Bellows Boots

Acme Screw & Nut Boot Selection and Dimensions

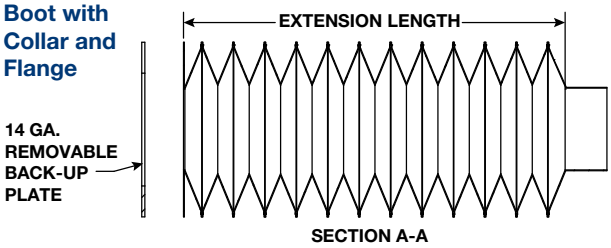
Boot End View



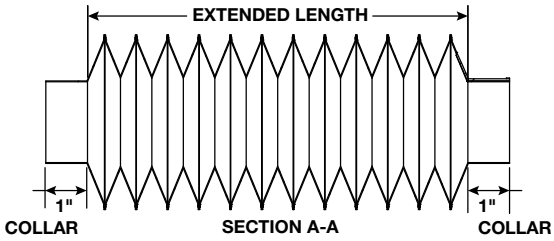
Boot with Flanges



Boot with Collar and Flange



Boot with Collars



Sleeve Boots Acme Nut No.	Boot Part No. Prefix	Acme Nut Diameter	Screw Diameter	Boot I.D.	Boot O.D.	Collar End Length	Flange Diameter	Boot Compression
050AN---	BTS125---	1.25	0.50	1.25	3.75	1 Inch	3.75	3/4 Inch per Foot
063AN---			0.63					
075AN---			0.75					
100AN---	BTS150---	1.50	1.00	1.50	4.00		4.00	
150AN---	BTS225---	2.25	1.50	2.25	4.75		4.75	
200AN---	BTS275---	2.75	2.00	2.75	5.25		5.25	
225AN---	BTS350---	3.38	2.25	3.50	6.00		6.00	
250AN---			2.50					
Zipper Boots Acme Nut No.	**Boot Part No. Prefix**	**Acme Nut Diameter**	**Screw Diameter**	**Boot I.D.**	**Boot O.D.**	**Collar End Length**	**Flange Diameter**	**Boot Compression**
050AN----	BTZ125----	1.25	0.50	1.25	3.75	1 Inch	3.75	2 Inch per Foot
063AN----			0.63					
075AN----			0.75					
100AN----	BTZ125----	1.50	1.00	1.50	4.00		4.00	
150AN----	BTZ225----	2.25	1.50	2.25	4.75		4.75	
200AN----	BTZ275----	2.75	2.00	2.75	5.25		5.25	
225AN----	BTZ350----	3.38	2.25	3.50	6.00		6.00	
250AN----			2.50					

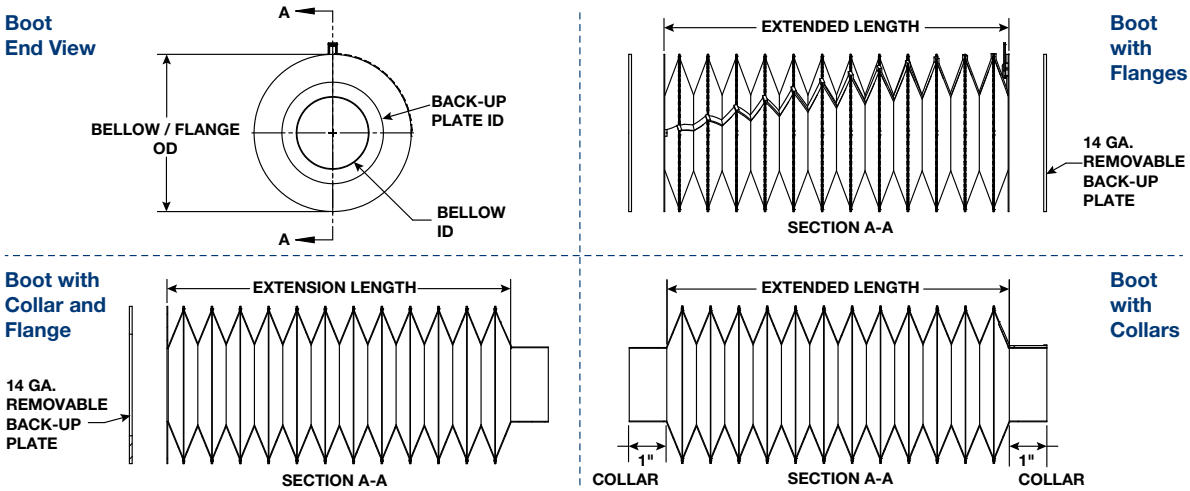
Note: Unless otherwise specified all dimensions are in Inches.

Note: Boots with internal guides can be supplied for horizontal applications to ensure smooth nut translating with out interference from fabric sagging - both the boots' ID and OD might need to be enlarged to accommodate the guides. Contact customer service for more information.

Note: Collar ID and Boot ID are the same dimension

Note: Boots for larger size Acme Nuts are available - contact Customer Service for assistance

Ball Screw & Nut Boot Selection and Dimensions



Sleeve Boots Ball Nut No.	Boot Part No. Prefix	Ball Nut Diameter	Screw Diameter	Boot I.D.	Boot O.D.	Collar End Length	Flange Diameter	Boot Compression
050BNH020	BTS150----	1.38	0.50	1.50	4.00	1 Inch	4.00	3/4 Inch per Foot
050BNH050	BTS175----	1.72		1.75	4.25		4.25	
063BNE020		1.60	0.63					
063BNE020L								
063BNH100		1.65						
075BNG020		1.56	0.75					
075BNH020								
075BNH050	BTS225----	2.12		2.25	4.75		4.75	
100BNE020	BTS225----	2.14	1.00	2.25				
100BNF025								
100BNF100		2.13						
117BNH041	BTS225----	2.31	1.17	2.50	5.00		5.00	
150BNH047	BTS300----	2.93	1.50	3.00	5.50		5.50	
150BNF100	BTS350----	3.44		3.50	6.00		6.00	
150BNR100	BTS400----	3.92		4.00	6.50		6.50	
150BNF187	BTS350----	3.36		3.50	6.00		6.00	
200BNH050	BTS400----	3.90	2.00	4.00	6.50		6.50	
200BNH100	BTS475----	4.58		4.75	7.25		7.25	
225BNH050	BTS400----	3.95	2.25	4.00	6.50		6.50	
225BNH050L								
225BNH100	BTS475----	4.60		4.75	7.25		7.25	

Zipper Boots Ball Nut No.	Boot Part No. Prefix	Ball Nut Diameter	Screw Diameter	Boot I.D.	Boot O.D.	Collar End Length	Flange Diameter	Boot Compression
050BNH020	BTZ150----	1.38	0.50	1.50	4.00	1 Inch	4.00	2 Inch per Foot
050BNH050	BTZ175----	1.72		1.75	4.25		4.25	
063BNE020		1.60	0.63					
063BNE020L								
063BNH100		1.65						
075BNG020		1.56	0.75					
075BNH020								
075BNH050	BTZ225----	2.12		2.25	4.75		4.75	
100BNE025		2.14	1.00					
100BNF025								
100BNF100		2.13						
117BNH041	BTZ250----	2.31	1.17	2.50	5.00		5.00	
150BNH047	BTZ300----	2.93	1.50	3.00	5.50		5.50	
150BNF100	BTZ350----	3.44		3.50	6.00		6.00	
150BNR100	BTZ400----	3.92		4.00	6.50		6.50	
150BNF187	BTZ350----	3.36		3.50	6.00		6.00	
200BHN050	BTZ400----	3.90	2.00	4.00	6.50		6.50	
200BHN100	BTZ475----	4.58		4.75	7.25		7.25	
225BHN050	BTZ400----	3.95	2.25	4.00	6.50		6.50	
225BHN050L								
225BHN100	BTZ475----	4.60		4.75	7.25		7.25	

Note: Unless otherwise specified all dimensions are in Inches.

Note: Boots with internal guides can be supplied for horizontal applications to ensure smooth nut translating without interference from fabric sagging - both the boots' ID and OD might need to be enlarged to accommodate the guides. Contact customer service for more information.

Bellows Boot Model Numbering System

BTZ150 - CC048X

Boot Type

BTS - Sleeve Boot
BTZ - Zipper Boot

Boot I.D.

(Inches)
Characters are shown without decimals for example:
1.25" I.D. shown as 125
2.00" I.D. shown as 200

End Types

C = Collar
F = Flange

Both spaces should be represented

Boot Length

(Inches)
Boot lengths are available in 1 ft. extended length increments

Characters are shown without decimals for example:
36" extended length shown as 036
144" extended length shown as 144

Optional Character

G - will appear in this space if internal guides are required

X - will appear in this space if internal guides are not required

Bellows Boots made with specialty fabrics or other non standard design features will have serialized suffix numbers such as - 0123.

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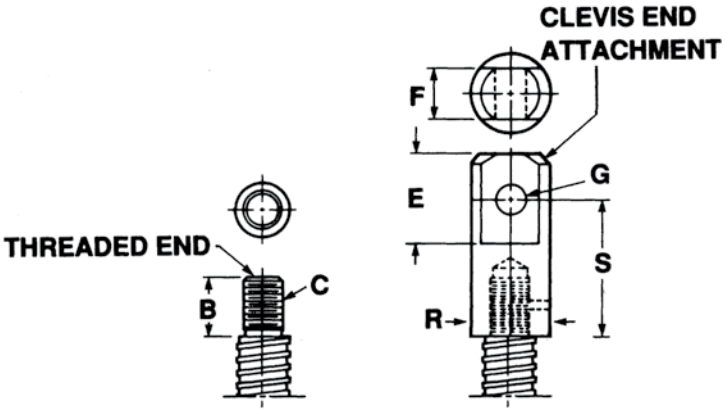
Clevis Ends

For certain applications it may be desirable to rotate the acme or ball nut around a non-rotating and firmly fixed screw. Duff-Norton provides standard End Plates and Clevis Ends attachments for such applications.

FEATURES

Some of the more important features are:

- Fabricated to common ANSI standard dimensions
- Drilled and tapped for common UN Threaded Screws
- Set-screw drilled, with hardware provided
- Readily available for most Acme & Ball Screws

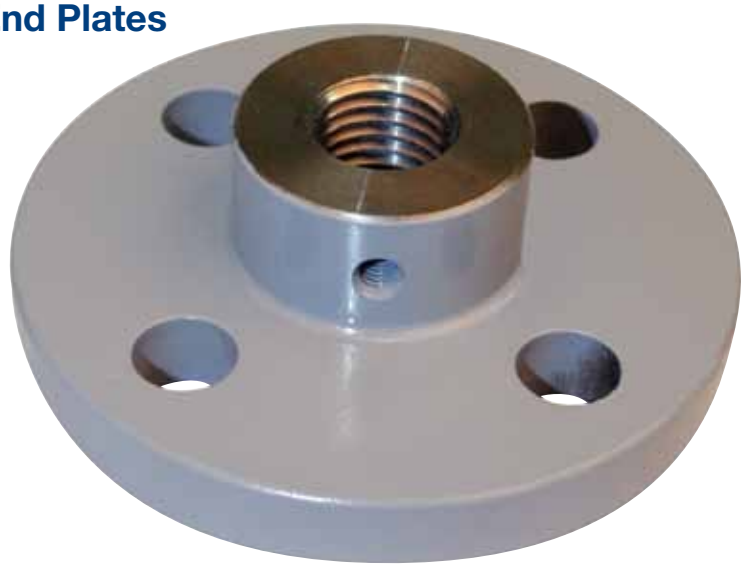


Clevis End Dimensions

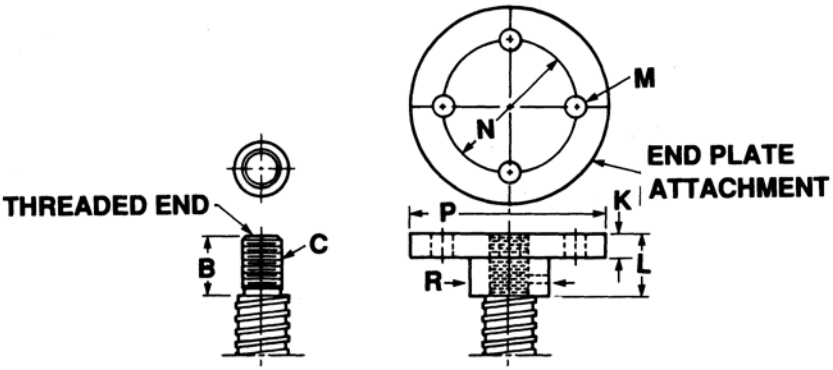
Acme Screw & Lead	Ball Screw & Lead	Clevis End Number	Dimensions (Inches)					
			B	C	E	F	G	R
.50 x .250 & .500	.500 - All	SK2800-4-29A	3/4	3/8-24-UNF-2A	1	1/2	5/16+.007/-.000	3/4
.63 & .75 - All	.631 - All							
1 x .250, .500 & 1.00	.750 - All	SK28750-8A		1/2-13UNC-2A	3/4			1-1/4
1 x .100 & .200	1.00 - All	SK2800-4-2A	1-1/8	3/4-16-UNF-2A	1-1/2	1	1/2+.008/-.000	1-1/2
—	1.17	SK2800-4-2A	1-1/8	3/4-16-UNF-2A	1-1/2	1	1/2+.008/-.000	1-1/2
1.50 - All	1.50 - All	SK2800-4-5A		1-14-UNS-2A	2-1/2	1-1/4	3/4+.010/-.000	1-3/4
2.00-All, 2.25 x .500	2.00 - All	SK2800-4-10A				1-1/2	1+.010/-.000	2
2.25 x .250	2.25 - All	SK2800-4-20A	2-1/4	1-3/4-12-UN-2A	3	1-3/4	1-1/4+.010/-.000	2-5/8
2.50 - All	—	SK2800-4-20A	2-1/4	1-3/4-12-UN-2A	3	1-3/4	1-1/4+.010/-.000	2-5/8
3.00 - All	3.00	SK2800-4-25A		2-1/4-12-UN-2A	5	2-3/4	1-1/2+.010/-.000	3-1/2
3.75 - All	4.00	SK2800-4-60A	2-3/4	3-1/4-12-UN-2A	5-1/4	3-3/4	2+.012/-.000	5

Note: some of the smaller diameter acme screws have root diameters to small to engage with the End Plate

End Plates



End Plate Dimensions



Acme Screw & Lead	Ball Screw & Lead	End Plate Number	Dimensions (Inches)							
			B	C	K	L	M	N	P	R
.50 x .250 & .500	.500 - All	SK2800-1-29A	3/4	3/8-24-UNF-2A	5/16	13/16	9/32	1-1/2	2-1/4	3/4
.63 & .75 - All	.631 - All									
1 x .250, .500 & 1.00	.750 - All	SK28750-1A		1/2-13UNC-2A	3/8	4/5	7/16	2-1/2	3-1/2	1-1/4
1 x .100 & .200	1.00 - All	SK2800-1-2A	1-1/8	3/4-16-UNF-2A	7/16	1-3/16	13/32	3	4-1/4	1-1/2
—	1.17									
1.50 - All	1.50 - All	SK2800-1-5A		1-14-UNS-2A	5/8	1-1/4	11/16	3-1/2	5	1-3/4
2.00 - All, 2.25 x .500	2.00 - All	SK2800-1-10A			3/4	1-3/8	13/16	4-1/8	5-3/4	2
2.25 x .250	2.25 - All	SK2800-1-20A	2-1/4	1-3/4-12-UN-2A	1	2-5/16		5	7	2-5/8
2.50 - All	—									
3.00 - All	3.00	SK2800-1-25A		2-1/4-12-UN-2A			1-1/6	6	8-1/2	3-1/2
3.75 - All	4.00	SK2800-1-60A	2-3/4	3-1/4-12-UN-2A	1-3/8	2-13/16	1-1/2	10	13	5

Note: some of the smaller diameter acme screws have root diameters to small to engage with the End Plate

NOTE

During installation it is necessary to thread the End Plate or Clevis End into its position, then drill through the tapped hole and to penetrate the screw's surface. When the attachment is in place, this will ensure that the supplied set-screw properly engages both the attachment and Acme or Ball Screw.

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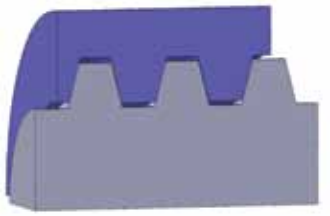
Duff-Norton offers three primary thread form types

Ball Screw, Modified Square, and Acme Screw

- **Ball Screw** threads have a rounded / gothic arch shape design to match the bearing balls within the ball nut. The ball nut will also have the same rounded / gothic arch shape. All ball screws are heat treated. Most ball screws are manganese phosphate coated, some ball screws are black oxide coated.
- **Modified Square** thread screws have straight-sided flanks. Larger size Duff-Norton acme screws have the modified square thread form. There is no measurable performance difference between the modified square and acme thread forms.
- **Acme Screw** threads have a nominal depth of thread of 0.50 x pitch and have a 29° included thread angle resulting in a angled tooth shape (some sizes have 40°).

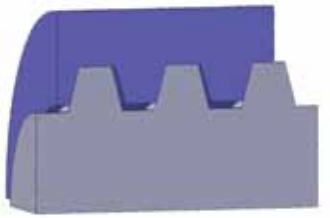
There are three main classes of Acme Screw thread forms:

General Purpose (G), Centralizing (C), and Stub Acme.



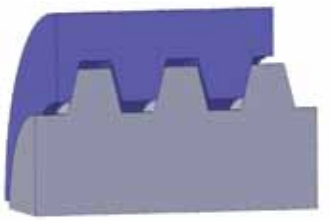
Side loaded (G) Class Nut

General Purpose (G) Thread class acme screws and nuts are manufactured with broader tolerances and clearances. In some horizontal applications a G class screw and nut assembly might bottom out and lock up when the nut's thread flanks come into contact with the screw's thread flanks. Duff-Norton screw and nut assemblies 3" in diameter and larger use general class thread forms.



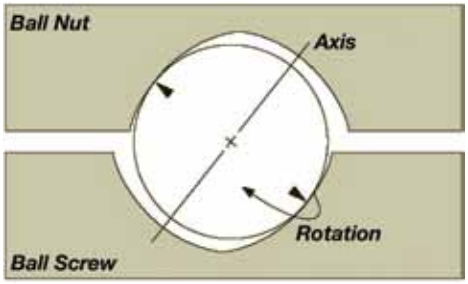
Side loaded (C) Class Nut

Centralizing (C) Thread class acme screws are manufactured with tighter flank tolerances and limited major diameter clearances. The combination of these features helps prevent the previously described operating scenario which can occur with general class threads. Duff-Norton screw and nut assemblies ranging from 1/2" to 2-1/2" use centralizing thread forms.



Normal loaded nut

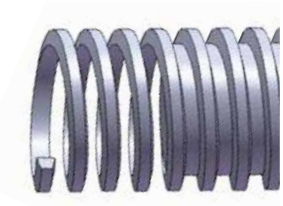
Stub Acme Thread forms are used in some of the small diameter screws and are made with the same tolerance characteristics as our centralizing threads, but have a thread depth less than one half the normal acme pitch.



Ball nut interior - contact points and clearance under normal conditions

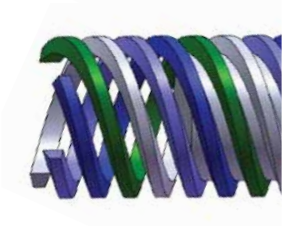
Screw Characteristics

Screw Starts are the number of independent threads on the screw shaft: One, Two or Four



Single Start Screw - Lead & Pitch are the same

Double Start Screw - Lead is 2 X Pitch



Four Start Screw - Lead is 4 X Pitch

Lead is the distance the nut advances along the screw in one revolution (lead = pitch x number of starts).

Pitch is the distance along the screw axis from a point on one thread to a corresponding point on adjacent thread.

Lead Error is the difference between what the travel should be and what the travel is. All forms of screw production yield minor inconsistencies in the distance between screw threads. For example: if an assembly were programmed to travel 24" and the screws' lead error was .004 inch per foot, the actual distance traveled could be from 23.996" to 24.004". Most modern day controls and programs are sophisticated enough to account and correct for lead error.

Root Diameter is the diameter of the screw at the bottom of the thread groove.

Standard Screw Lengths and Materials

Most screws are available with right hand threads (our 4.5" and 5" acme screws are supplied with Left Hand threads as standard). Left hand thread screws may be available in other sizes depending on order requirements.

Standard screw lengths are 36", 72", and 144". Some custom ball screws are available in 240" lengths depending on screw diameter. Custom length acme screws over 144**"** can be manufactured based on material availability.

Stainless steel screws can be provided for many diameters and leads.

Production Processing

Duff-Norton employs three production techniques to manufacture screws.

- **Rolled Acme Screws** – use a combination of feed rates and compression through a machine with cylindrical dies to roll a screw into its desired form.
- **Machine cut Acme Screws** – use high-end flat bed machines and several different cutting techniques to produce the desired form.
- **Rolled Ball Screws** – are rolled, induction hardened, inspected for quench cracks, and then manganese phosphate or black oxide coated.

There are only minor screw surface finish differences resulting from rolling or machine cutting Acme screws, and there are production and functional advantages and disadvantages to screws made from either process.

Good and consistent lubrication is much more important to a successful application than whether or not a screw was cut or rolled. All screw and nut systems should be lubricated often enough or in such a fashion the lubricant film is always present.

Nut Characteristics

Bronze Acme Nuts

Through our years of experience Duff-Norton has chosen and uses two different bronze blends based on the desired performance characteristics. The bronze used for our smaller size nut performs extremely well in applications where the probability of friction and wear are high (Yield 49,000 psi, Ultimate Strength 68,000 psi, Hardness 74 Rockwell B min, Thermal Conductivity 58 BTU (Sqft-ft-hr-f)).

Larger size acme nuts use a different bronze selected for strength, abrasion, and impact properties (Yield 29,500 psi, Ultimate Strength 74,500 psi, Compressive Strength 100,000 psi, Hardness 170 BHN).

Plastic Acme Nuts

Duff-Norton plastic acme nuts are made from a high viscosity homopolymer with Teflon fibers and serve most industrial applications very well (Tensile Strength 7,700 psi @ 73° F, Ultimate Strength 7,700 psi @ 73° F, PV Limit @ ft-lbs 11,000). Specialty plastics may be provided upon request.

Ball Nuts

Duff-Norton plastic acme nuts are made from a high viscosity homopolymer with Teflon fibers and serve most industrial applications very well (Tensile Strength 7,700 psi @ 73° F, Ultimate Strength 7,700 psi @ 73° F, PV Limit @ ft-lbs 11,000). Specialty plastics may be provided upon request.

Flanges

All ball nut flanges are made from steel and black oxided. Smaller size acme nut flanges are also made from steel and black oxided. Larger size acme nuts have an integral bronze flange.

⚠ CAUTION

Ball Nut Installation - Ball nuts are normally supplied on arbors. After clipping the retaining binder, care must be taken to slide or position the arbor onto or next to the ball screw. Rotate the screw or ball nut so that the ball nut clears the screws end before removing the arbor from its position. Ball nut removal should be done the same way. Failure to perform these actions may result in the bearing balls falling out of the ball nut and possible loss of bearing balls. While being installed or handled it is strongly advised that temporary stops such as tape or rubber bands be positioned on either end of the ball nut and only removed after installation is complete.

⚠ CAUTION

Flange Installation - During installation, after threading the flange and nut together; the nut may be drilled and tapped from the back end for a set screw. While spot drilling the nut and flange assembly avoid getting metal chips in the nuts' ball threads. Then install a dog point set screw or pin to secure the assembly

Performance Characteristics

Static Capacity

The maximum dead weight load the screw and nut assembly can advisably hold.

Dynamic Capacity

The maximum load the screw and nut assembly can advisably move.

Efficiency

A ratio of work output and work input with the difference being lost energy. These ratios are calculated as lubricated efficiencies and will vary depending on the nut material.

Torque to Raise

The amount of rotational force required to move one pound of load.

Acme Life

As mentioned, Duff-Norton manufactures our acme product from high quality materials. Still, there are too many variables involved in a given application for us to accurately predict acme nut life. This is largely due to inconsistent lubrication, and also the friction of dissimilar metals rubbing against one another.

Ball Life

Because of the ball screw and nut design, these assemblies operate very efficiently and life ratings can be provided. Please see page 130.

Ball Nut Orientation

Proper orientation is important in horizontal applications. Return tubes located on one side of the ball nut only should be mounted facing up. Return tubes located on opposing sides of the ball nut should be mounted horizontally. Ball nut return tubes should not be installed in a downward position.

Backdriving

Generally speaking, any acme screw with a lead greater than .250" may be subject to backdriving or creep. Backdriving is when the force of the static load causes the un-driven screw to rotate. The use of a brake motor is recommended in these applications. Acme screws with diameters .750" or larger and leads .250" or less are inherently self-locking.

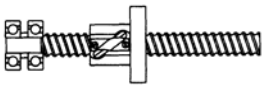
Backlash

Backlash results from the space tolerance between the threads of the screw & nut and always increases with use. This undesirable motion will occur when the load is changing direction, and the load shifts to the opposite thread flank.

Load Conditions

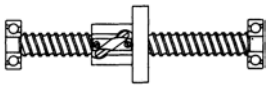
End Fixity

The method by which the screw's ends are supported. There are 3 common methods of end fixity which are frequently used in 4 combinations. "Free" support means the screw end is not supported. "Simple" support means the screw end is supported at one point only. "Fixed" support means the screw end is rigidly restrained.



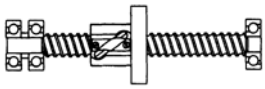
Fixed - Free

Double bearing support on one screw end, the other end is not supported.



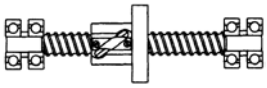
Simple - Simple

Single bearing support on both screw ends.



Fixed - Simple

Double bearing support on one screw end, single bearing support on the other screw end.



Fixed - Fixed

Double bearing support on both screw ends.

Column Strength

All screws loaded in compression are subject to buckling or bending although screw end-fixity can greatly impact column strength. It is important to understand the point at which these conditions are likely to occur. Please consult the tables on page 138 for more information.

Critical Speed

Is the maximum recommended rate at which the screw should be turned. Critical speeds are high subject to screw diameter, length, and end-fixity. Please consult page 139.

Load Definitions

Static Load

The maximum dead-weight load that can be applied to a non-moving system.

Dynamic Load

The maximum recommended load that can be moved by a system.

PV Load

The severity of an application is something which should be considered when selecting a screw and nut system as all nuts are subject to heat buildup. The amount of pressure on the nut and surface velocity greatly impact system temperature. PV Values and formulas for Duff-Norton acme nuts provided on page 134.

Tension Load

Occurs when a load pulls on the screw and its support.

Compression load

Occurs when a load pushes on the screw and its support.

Radial Load

Occurring either from the side or over-turning of the nut while travelling along the screw may be detrimental to system performance. Our customer service team will be glad to discuss your application with you to determine the best installation for your application.

PV Values

Bronze Nut Part Numbr	P Factor	Maximum Speed at Rated Load (in/min)	Plastic Nut Part Number	P Factor	Maximum Speed at Rated Load (in/min)
050ANB010	1.56	11			
050ANB020	2.93	22			
050ANB025	3.93	27	050ANP025	3.93	8
050ANB050	3.93	55	050ANP050	3.93	16
063ANB010	1.23	9			
063ANB013	1.26	11			
063ANB020	2.31	17			
063ANB025	3.14	22	063ANP025	3.14	6
063ANB050	3.07	44	063ANP050	3.07	14
075ANB010	0.68	7			
075ANB020	0.72	15			
075ANB025	0.75	18	075ANP025	0.75	11
075ANB050	0.75	36	075ANP050	0.75	25
075ANB100	0.74	73	075ANP100	0.74	46
100ANB010	0.50	5			
100ANB020	0.53	11			
100ANB025	0.48	14	100ANP025	0.48	10
100ANB050	0.48	27	100ANP050	0.48	22
100ANB100	0.48	55	100ANP100	0.48	40
150ANB010	0.20	4			
150ANB025	0.19	9			
150ANB038	0.18	14	150ANP038	0.18	12
150ANB050	0.21	18	150ANP050	0.21	12
200ANB025	0.12	7			
200ANB050	0.12	14			
225ANB025	0.11	6			
225ANB050	0.12	12			
250ANB025	0.09	5			
250ANB050	0.11	11			
300ANB032	0.07	6			
300ANB066	0.07	12			
375ANB067	0.06	10			
375ANB133	0.06	19			
375ANB032	0.32	5			
450ANB032	0.25	4			
450ANB066	0.11	8			
500ANB066	0.05	7			
600ANB075	0.03	7			
600ANB100	0.02	9			
700ANB100	0.02	8			
900ANB100	0.01	6			

The “Maximum PV value” for plastic nuts is 11,000

The “Maximum PV value” for bronze nuts is 50,000

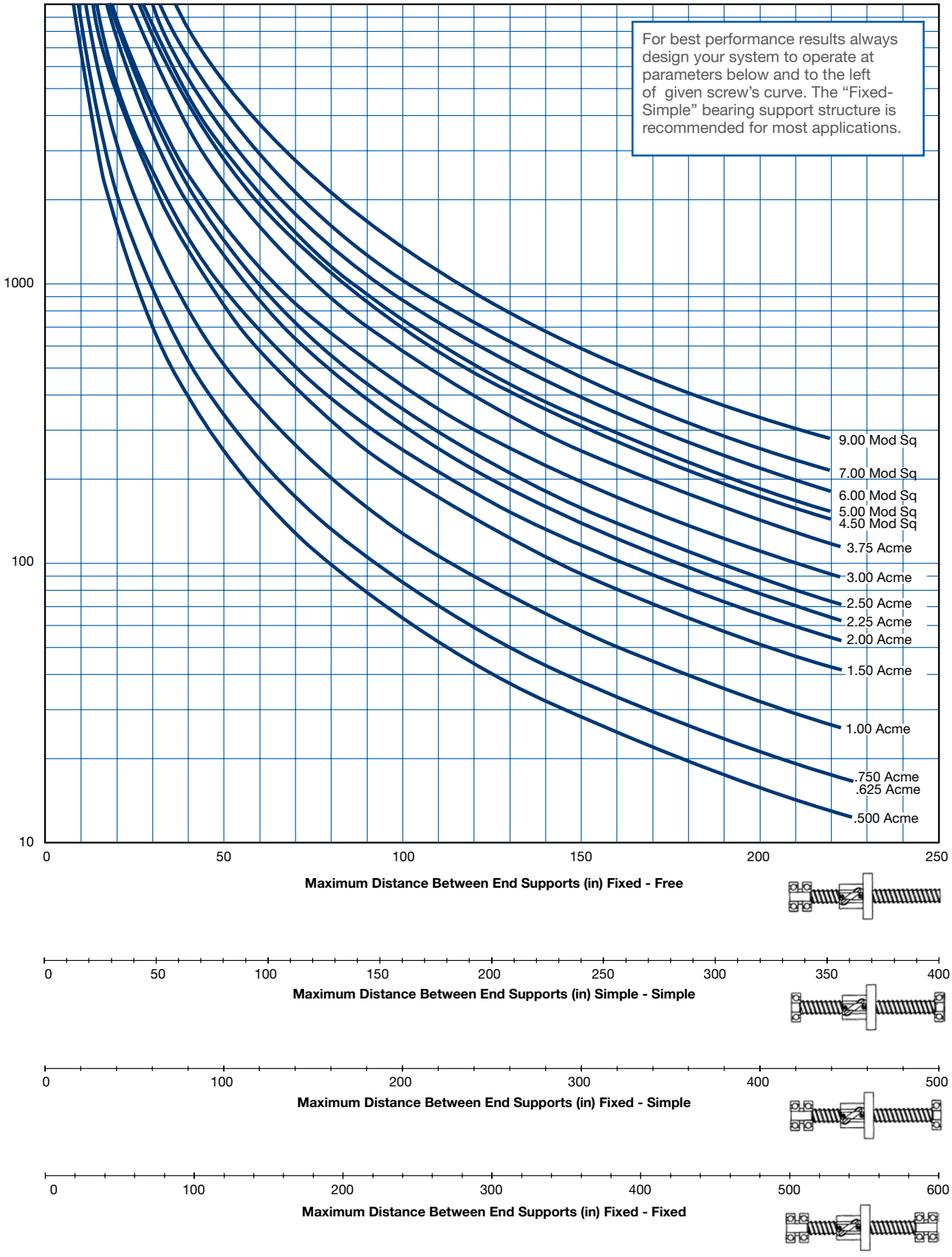
The PV calculation method is:

1) Find P; P = Actual Load (Pounds) x Pf (P factor)

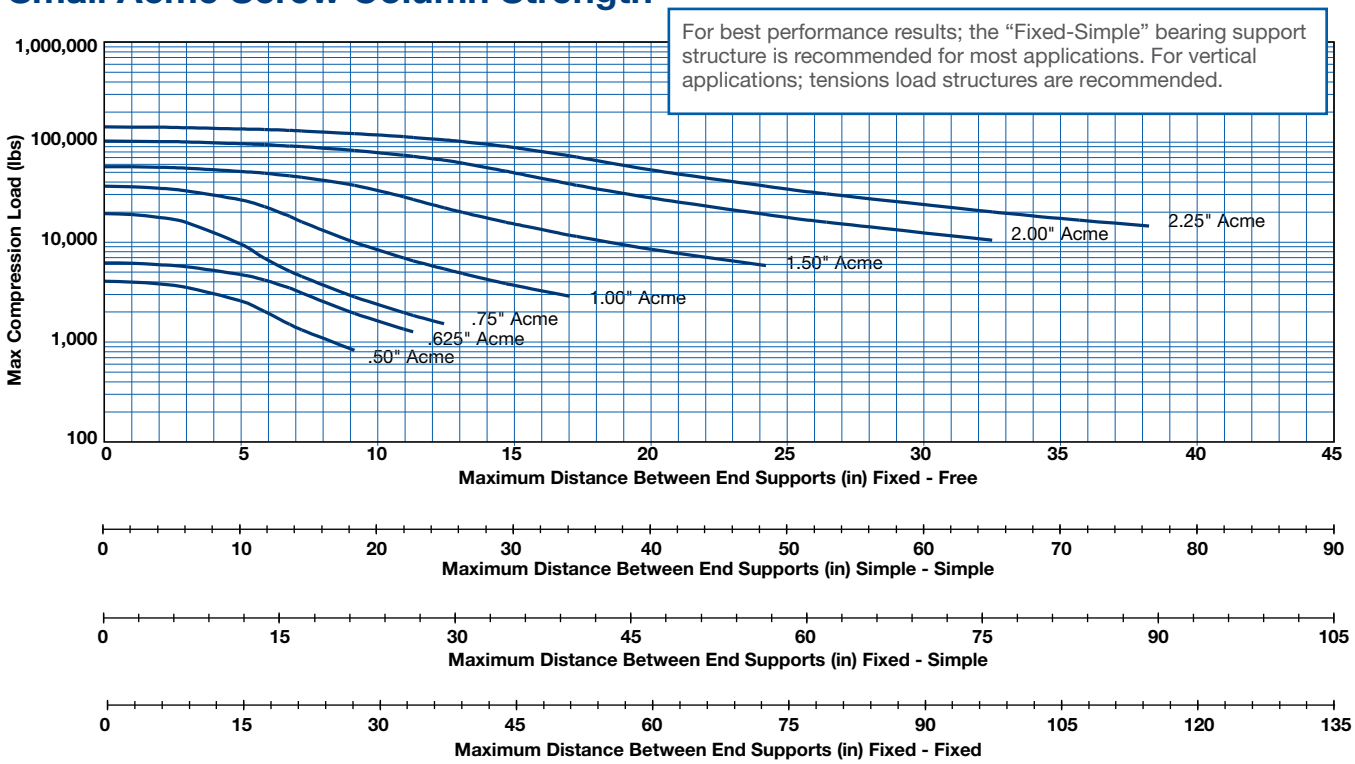
2) Find V; V = .2618 x Nominal diameter of the screw (inches) x Rotational speed of the screw (rev per minute)

3) Compare the results to the maximum limit: P x V must be less than “Maximum PV Value”

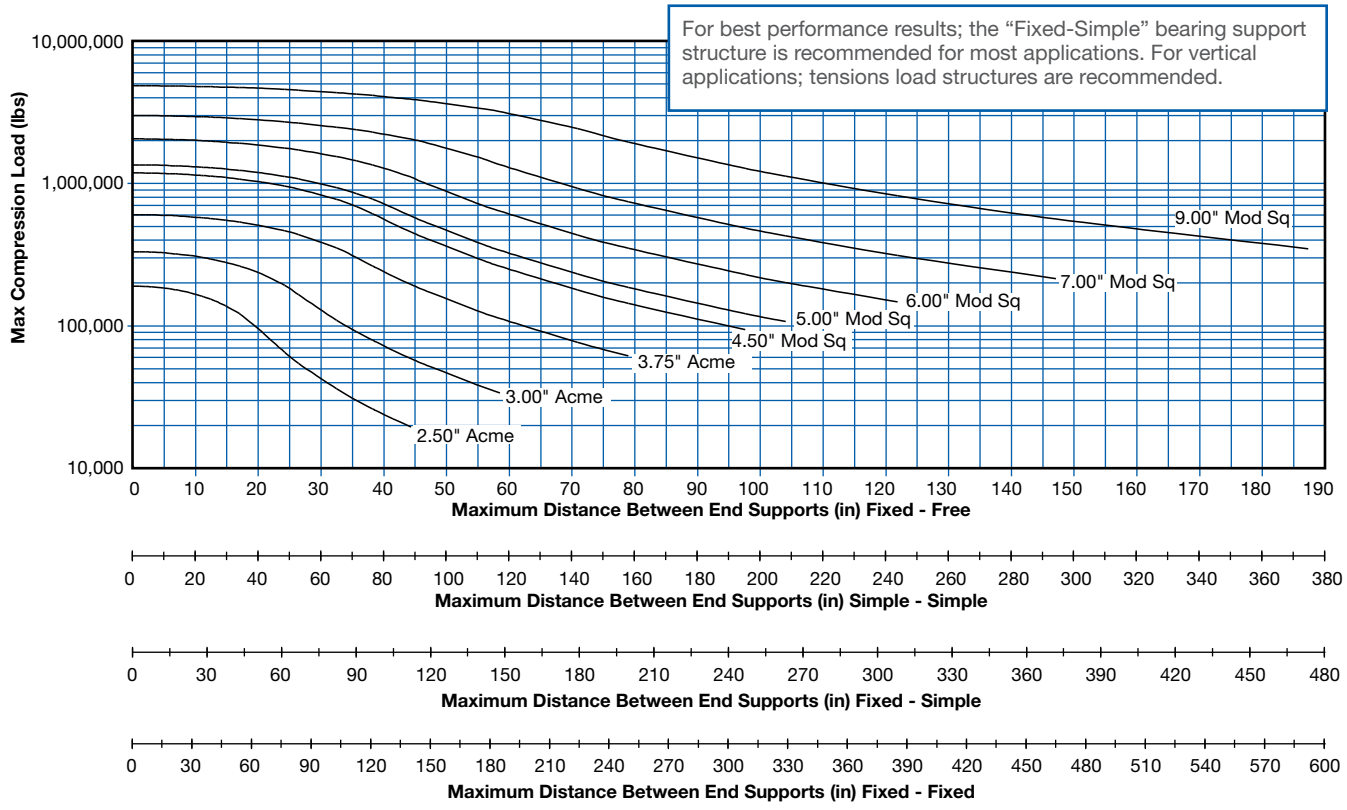
Note: Rotational speed of the screw (revolutions per minute) = Linear speed of the screw (inches per minute) / Lead of the screw (inches per revolution)


For best performance results always design your system to operate at parameters below and to the left of given screw's curve. The "Fixed-Simple" bearing support structure is recommended for most applications.
1000
100
10
9.00 Mod Sq
7.00 Mod Sq
6.00 Mod Sq
5.00 Mod Sq
4.50 Mod Sq
3.75 Acme
3.00 Acme
2.50 Acme
2.25 Acme
2.00 Acme
1.50 Acme
1.00 Acme
.750 Acme
.625 Acme
.500 Acme
0 50 100 150 200 250
Maximum Distance Between End Supports (in) Fixed - Free
0 50 100 150 200 250 300 350 400
Maximum Distance Between End Supports (in) Simple - Simple
0 100 200 300 400 500
Maximum Distance Between End Supports (in) Fixed - Simple
0 100 200 300 400 500 600
Maximum Distance Between End Supports (in) Fixed - Fixed

Small Acme Screw Column Strength

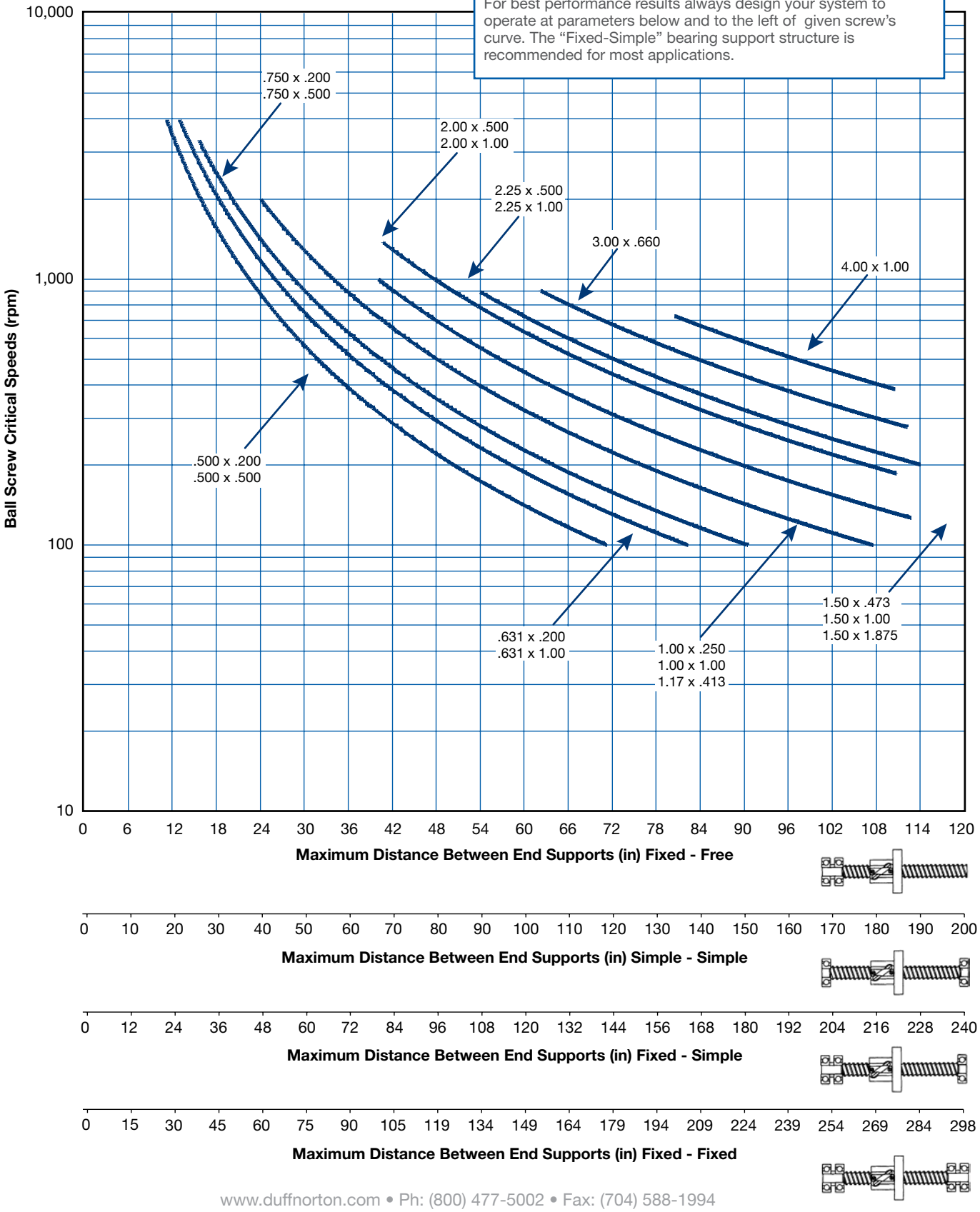


Large Acme Screw Column Strength

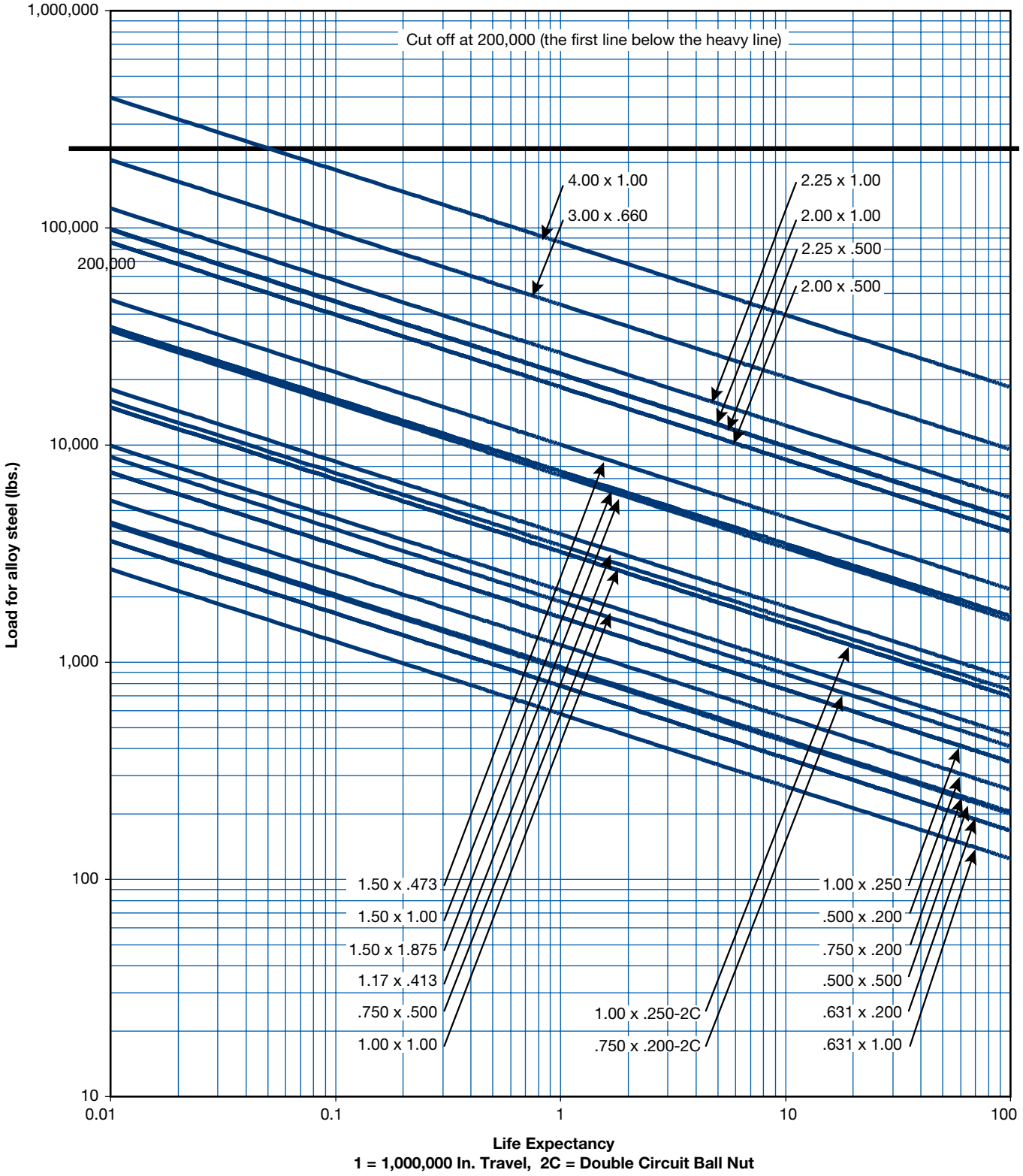


Critical Speeds - Ball Screw

For best performance results always design your system to operate at parameters below and to the left of given screw's curve. The "Fixed-Simple" bearing support structure is recommended for most applications.



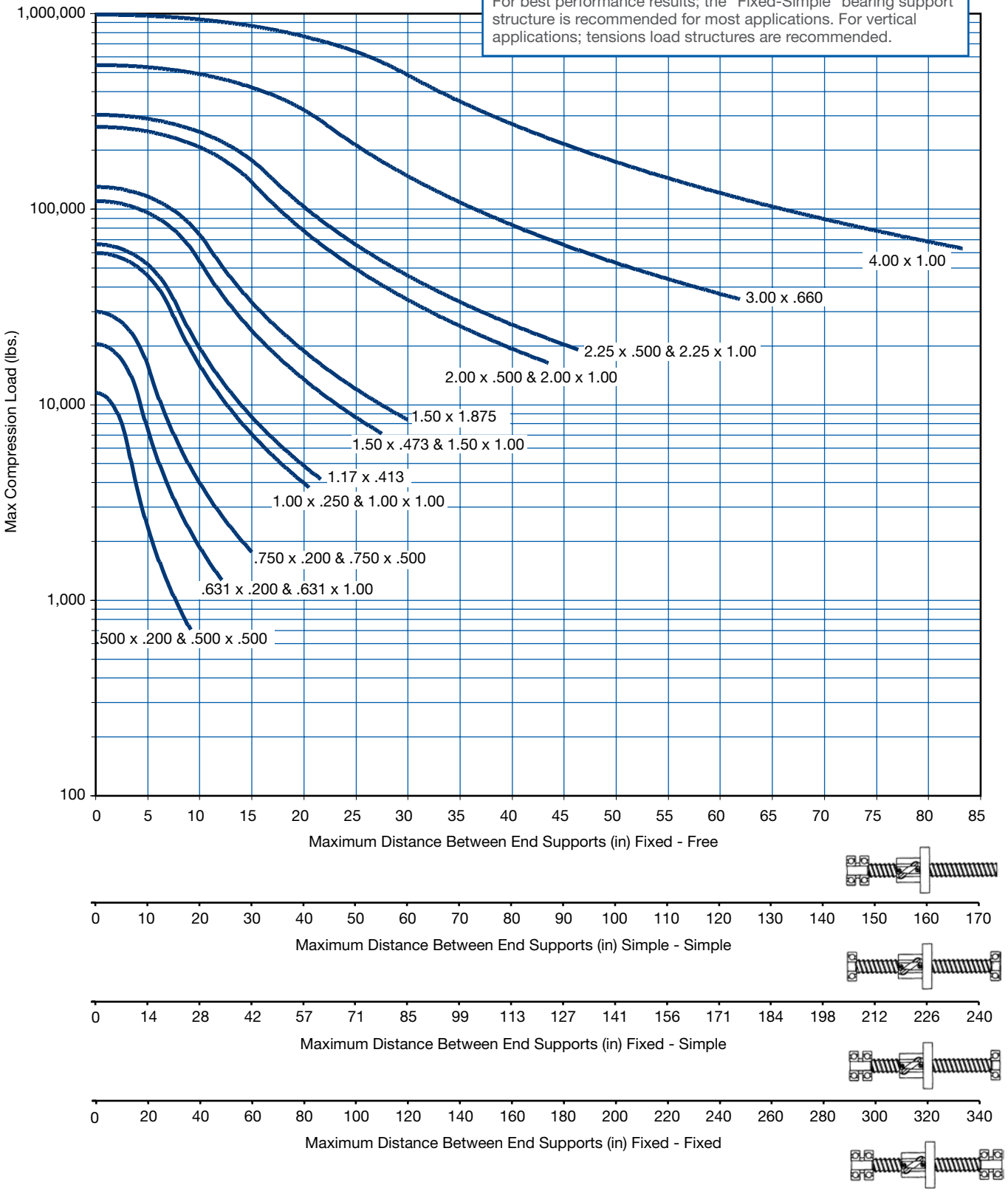
Ball Screw Life Performance



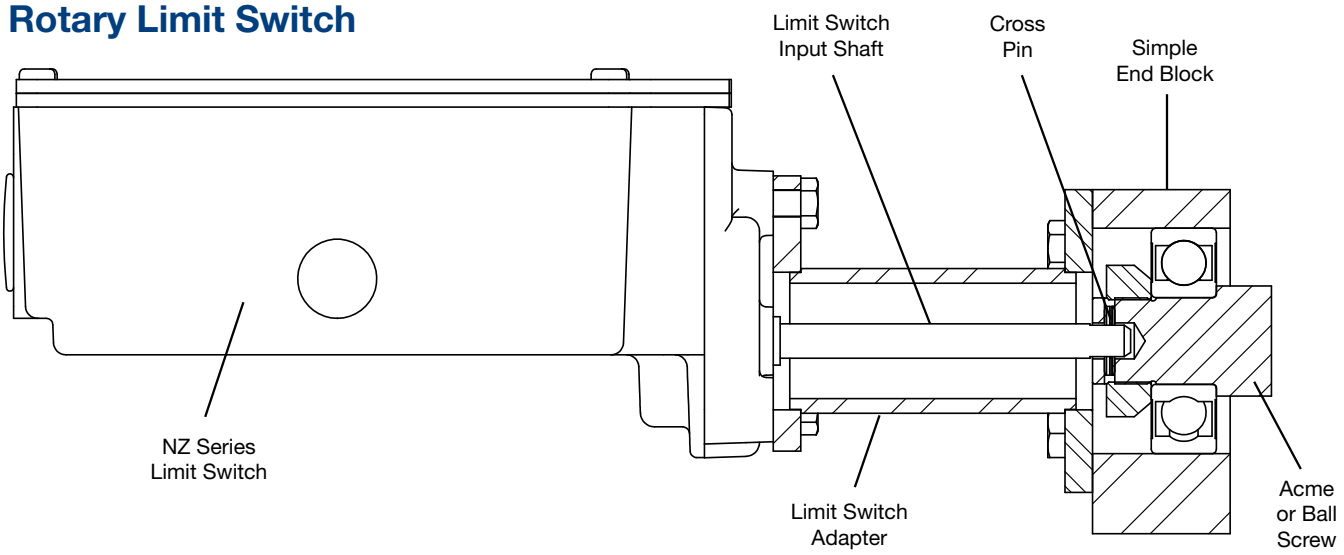
Life Expectancy
1 = 1,000,000 In. Travel, 2C = Double Circuit Ball Nut

Ball Screw Column Strength

For best performance results; the “Fixed-Simple” bearing support structure is recommended for most applications. For vertical applications; tensions load structures are recommended.



Rotary Limit Switch



Instructions for installing our NZ Series Limit Switches to our Simple End Blocks

1. The Simple End Block is designed to be a “floating block” and should be moved backwards on to the acme or ball screw.
2. Mount the bearing in place on the screw’s journal.
3. Insert the cross pin into the hole drilled parallel to the screw’s end, then thread the lock nut in place.
4. Mount the Limit Switch adapter to the NZ Series Limit Switch with the input shaft extending beyond the adapter’s far edge.
5. Mount the Limit Switch and Adapter to the repositioned Simple End Block’s face, the end of the limit switches input shaft is slotted to fit into the screw’s end and over the cross pin. The acme or ball screw’s end will now be flush with the End Blocks face.

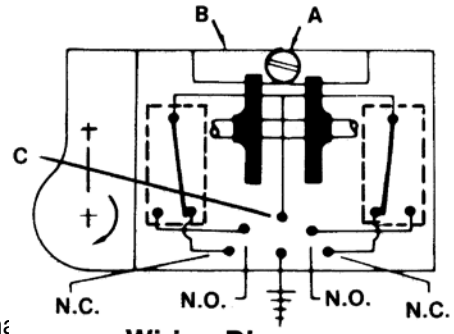
NOTE

Journal Ends and End Block sizes 000 and 001 use a small coupling to connect the Limit Switches input shaft to the screw’s journal. Contact Customer Service for SKA Series Limit Switch installation instructions.

Rotary Limit Switch Electrical Wiring Diagram and Setting Instructions

1. CAUTION: Disconnect power before making any adjustment.
2. Check drift before adjusting limits.
3. Remove screw “A” and nut guide keeper “B” to adjust limits.
4. Run the screw system to desired limit.
5. Rotate appropriate nut until switch clicks, then turn 1/2 turn more.
6. Replace “A” and “B.”
7. Run the screw system to other limit.
8. Repeat steps 2, 4 and 5 to adjust this nut.

Slight adjustments may be necessary. See Performance Specification Cha
on page 89 for notch adjustment value.



Wiring Diagram
“A” & “B” Models

TERMS OF SALE

All sales by Seller are made pursuant to the following terms. No other or additional terms or conditions are or will be accepted.

ACCEPTANCE OF ORDERS -

All orders, whether placed directly or through an agent, and all subsequent amendments thereto, are subject to a final approval and acceptance by Seller's main office.

LIMITATION OF WARRANTIES, REMEDIES AND DAMAGES –

THE WARRANTY STATED BELOW IS GIVEN IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE. NO PROMISE OR AFFIRMATION OF FACT MADE BY ANY AGENT OR REPRESENTATIVE OF SELLER SHALL CONSTITUTE A WARRANTY BY SELLER OR GIVE RISE TO ANY LIABILITY OR OBLIGATION.

Seller warrants that on the date of its delivery to carrier the goods are free from defects in workmanship and materials.

SELLER'S SOLE OBLIGATION IN THE EVENT OF BREACH OF WARRANTY OR CONTRACT OR FOR NEGLIGENCE OR OTHERWISE WITH RESPECT TO GOODS SOLD SHALL BE EXCLUSIVELY LIMITED TO REPAIR OR REPLACEMENT, F.O.B. SELLER'S POINT OF SHIPMENT, OF ANY PARTS WHICH SELLER DETERMINES TO HAVE BEEN DEFECTIVE or if Seller determines that such repair or replacement is not feasible, to a refund of the purchase price upon return of the goods to Seller.

Any action against Seller for breach of warranty, negligence or otherwise must be commenced within one year after such cause of action accrues.

NO CLAIM AGAINST SELLER FOR ANY DEFECT IN THE GOODS SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE YEAR FROM THE DATE OF SHIPMENT.

Seller shall not be liable for any damage, injury or loss arising out of the use of the goods if, prior to such damage, injury or loss, such goods are (1) damaged or misused following Seller's delivery to carrier; (2) not maintained, inspected, or used in compliance with applicable law and Seller's written instructions and recommendations; or (3) installed, repaired, altered or modified without compliance with such law, instructions or recommendations.

UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES AS THOSE TERMS ARE DEFINED IN SECTION 2-715 OF THE UNIFORM COMMERCIAL CODE.

TERMS OF PAYMENT -

Unless otherwise stated herein, payment of each invoice is required within thirty (30) days after date of shipment. Any balance unpaid after the required payment date shall be subject to a service charge of 1% per month from such date.

PRICE ADJUSTMENTS -

Amendments made by the Buyer to orders already placed shall, without formal notice to the Buyer, be subject to extra charges. If the estimated shipping date for the goods is more than sixty (60) days after date of order, the price of the goods are subject to increase by Seller.

TAXES -

Any sales, use, excise, and other taxes applicable to this transaction and the goods and/or services furnished by Seller are not included in the price and shall be paid by Buyer when due. If Seller pays any such taxes, Buyer shall reimburse Seller upon demand.

INDEMNIFICATION AND SAFE OPERATION -

Buyer shall comply with and require its employees to comply with directions set forth in instructions and manuals furnished by Seller and shall use and require its employees to follow such instructions and manuals and to use reasonable care in the use and maintenance of the goods. Buyer shall not remove or permit anyone to remove any warning or instruction signs on the goods. In the event of personal injury or damage to property or business arising from the use of the goods, Buyer shall, within forty-eight (48) hours thereafter, give Seller written notice of such injury or damage. Buyer shall cooperate with Seller in investigating any such injury or damage and in the defense of any claims arising therefrom.

If Buyer fails to comply with this section or if any injury or damage is caused, in whole or in part, by Buyer's failure to comply with applicable federal or state safety requirements, Buyer shall indemnify and hold Seller harmless against any claims, loss or expense for injury or damage arising from the use of the goods.

GOVERNING LAW -

This agreement shall be governed by and construed under the laws of the State of New York.

DELIVERY AND DELAYS -

Unless otherwise specified herein, deliveries shall be F.O.B. Seller's point of shipment and risk of loss shall pass to Buyer upon Seller's delivery to carrier. All shipping dates are approximate and Seller shall not be liable for loss or damage because of delays occasioned by labor disputes, damage to facilities, or failure of suppliers or subcontractors to meet scheduled deliveries or any other cause beyond Seller's reasonable control or making its performance commercially impracticable.

Not withstanding other provisions hereof, if shipment is delayed at Buyer's request, the goods shall be deemed to be stored at Buyer's risk and expense and Seller may thereupon bill Buyer for the full price and storage costs. Buyer shall pay such bill within 30 days after mailing thereof.

BUYER'S INSPECTION UPON RECEIPT OF SHIPMENT -

Buyer shall inspect the goods as soon as received. If any loss or damage is discovered, Buyer must notify both the carrier and Seller at once. Seller will cooperate with Buyer in filing claims with the carrier.

CHANGES AND CANCELLATION -

Seller reserves the right to change or cancel any order whenever circumstances require allocation of production or delivery or Seller deems change or cancellation to be necessary to comply with applicable laws, ordinances, regulations, directives or administrative actions. Seller reserves the right to make changes in materials or design which it determines appropriate for the goods.

SECURITY INTEREST AND REPOSSESSION -

Until full payment has been made therefor, Seller shall have a security interest in goods shipped to Buyer and the goods shall remain personal property. Upon request Buyer shall execute and deliver to Seller security agreements and financing statements further evidencing Seller's security interest. Buyer authorizes Seller to file a financing statement or statements relating to the goods, without Buyer's signature thereon, as Seller may deem appropriate and appoints Seller as Buyer's attorney-in-fact for the limited purpose of executing (without requiring Seller to do so) financing statements in Buyer's name and performing other acts which Seller deems appropriate to perfect and continue its security interest and to protect and preserve the goods.

In the event Buyer defaults in making any payment due Seller, Seller in addition to any other rights or remedies provided by law, shall have the right, with or without legal process, to enter the place where said goods are located and to repossess the goods in accordance with the Uniform Commercial Code.

ASSURANCES -

Shipment by Seller shall at all times be subject to the prior approval of its credit personnel and Seller may, at any time, decline to make shipment except upon receipt of prior payment or upon other terms and conditions or security satisfactory to such personnel.

PATENTS -

Except as to goods manufactured according to design supplied by Buyer, Seller will defend and hold Buyer free and harmless in a suit or proceeding brought against Buyer insofar as it is based on a claim that use of the goods by Buyer constitutes an infringement of any existing U.S. Patents, provided, however, that Buyer gives Seller prompt written notice of such suit or proceeding; permits Seller, through its counsel, to defend and/or settle the same; and gives Seller all necessary information, assistance and authority to enable Seller so to do. If Buyer's use of the goods is held to constitute infringement and further use is enjoined, Seller shall, at its option, either (i) procure for Buyer the right to continue using the goods; or (ii) replace the goods with non-infringing goods; or (iii) modify the goods to non-infringing goods. The foregoing states Seller's entire liability for patent infringement and shall not be construed to render Seller liable for damages based on product output.

MISCELLANEOUS -

This instrument constitutes the entire agreement between Seller and Buyer, superseding all previous understandings and writings regarding this transaction. Any amendment or modification of this Agreement shall be void unless in writing and signed by Seller.

No delay or omission by Seller in exercising any right or remedy hereunder shall be a waiver thereof or of any other right or remedy, and no single or partial exercise thereof shall preclude any other or further exercise thereof or the exercise of any other right or remedy. All rights and remedies of Seller are cumulative.

Sales made pursuant to this Agreement shall be governed by the Uniform Commercial Code as the same may from time to time be construed and in effect in the state wherein Seller has its main office.

ARBITRATION -

All disputes that may arise between the parties regarding the interpretation of the contract and the legal effect of the contract shall, to the exclusion of any court of law, be arbitrated and determined in accordance with the latest Commercial Arbitration Rules of the American Arbitration Association. The arbitration proceeding shall be held in the city in that state where the principal office of the Seller is located. The parties recognize and consent to the above mentioned arbitration association's jurisdiction over each and every one of them.

USTS rev. 2/98

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