

LINEAR ACTUATORS

DESIGN GUIDE



INTRODUCTION

Since 1883 Duff Norton has been at the forefront of motion technology and through continuous improvement and lean manufacturing models has established a reputation for the highest quality in engineering and design.

Today Duff Norton is the largest manufacturer of motion technology products worldwide, serving global markets in conjunction with Pfaff-silberblau and Duff Norton Europe, providing customers with reliable high quality solutions for their industrial lifting, positioning and transfer needs.

With an ISO 9001 registration since 1994 all Duff Norton products, standardized or custom designed, are subjected to the same rigorous testing and scrutiny to assure maximum performance and quality.

Duff-Norton's wide range of Linear Actuator Products feature:

- Load capacities ranging from 27 to 50,000 pounds
- Gear or belt drives
- Acme screw and ball screw systems
- A variety of AC and DC voltages
- Limit switches or load limiting clutches
- Position feedback
- Customized and modular systems

Duff-Norton linear actuator products are specially designed for a variety of industrial and commercial applications. Our actuators are used for opening and closing, tilting and pivoting, lifting and lowering and positioning.

NOTE

Duff-Norton has made every effort to ensure that the information contained in the publication is accurate and reliable. Determining the suitability of our products for specific applications is the user's responsibility.

WARNING

The equipment shown in this catalog is intended for industrial use only and should not be used to lift, support, or otherwise transport people unless you have written statement from Duff-Norton, which authorizes the specific actuator used in your applications as suitable for moving people.

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LINEAR ACTUATOR SELECTION GUIDE

DETERMINE THE FOLLOWING LINEAR ACTUATOR REQUIREMENTS

- Capacity The force required to move and hold the load
- Voltage The AC or DC motor voltage needed to operate the actuator
- Travel The distance or range of motion
- Speed The rate at which the linear actuator moves the load
- Duty Cycle Percentage of time an actuator is in motion relative to total time
- Orientation The relative position or direction in which the force is applied
- Environment The surrounding conditions in which the system will operate

Once you determine the linear actuator specifications, selection of an actuator model can be simplified by using the Quick Reference Table on page 6.

Linear Actuator Application Analysis Form



Duff-Norton engineers will be pleased to make recommendations for your specific requirements. Complete this form and mail or fax it to Duff-Norton Company. There is no obligation for this service. Use a separate sheet to sketch your application, or send us your design drawings in complete confidence.

Customer: _____

Address: _____

Phone Number: _____ Fax Number: _____

Contact: _____

Email Address: _____

1. How many pounds do you need to move, or how great is the force you need to exert on the load (in pounds or newtons)? _____

2. How many inches (mm) do you need to move the load? _____

3. What is your available power source?

- 115 VAC, 60Hz 220 VAC, 50Hz 12 VDC 24VDC
 Other (Please Specify) _____

4. Do you need: Clutch Limit Switch Both

5. How fast (inches/min. or mm/min.) do you want the actuator to extend or retract? _____

6. How many cycles per hour do you need the actuator to perform? _____

7. Do you require position feedback? Yes No

8. All AC actuators require a capacitor for operation. Do you want Duff-Norton to supply a capacitor?
(NOTE: for 1500 pound and above capacity models, a capacitor is automatically supplied)

- Yes, please supply capacitor No, I will purchase a capacitor separately that meets the specifications outlined by Duff-Norton.

9. Do you have any special requirements such as weather resistant treatment, non standard lifting stroke, explosion proof, special end or mounting? _____

10. How many actuators are required? _____

11. Do you require any actuator controls? Yes No

If you have any questions or are in need of assistance please call our Application Engineers at 800-477-5002



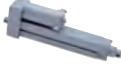



<p>⚠ WARNING</p> <p>Improper use can result in personal injury. To avoid injury:</p> <ul style="list-style-type: none">• Do not use actuators to lift, support, or transport people or loads over people, without written approval from Duff-Norton.• Read all product warnings and operating instructions.









Please mail or fax completed sheet to:



P.O. Box 7010 • Charlotte, NC 28241-7010
FAX 704-588-1994
www.duffnorton.com

QUICK REFERENCE

Series	LT	LS	TMD01	TMD02	HMPD w/ Limit Switch	HMPD w/ Clutch	HMPB	HSPB	
Capacity	27 to 225 lbs (120 to 1,000 N)	450 to 675 lbs (2,000 to 3,000 N)	100 lb (444 N)	250 lb (1,112 N)	250 lb (1,112 N)	250 lb (1,112 N)	250 lb (1,112 N)	250 lb (1,112 N)	
Product Image									
Voltages	12 Vdc or 24 Vdc	12 Vdc or 115 Vac	12 Vdc or 24 Vdc	12 Vdc or 24 Vdc	12 Vdc	12 Vdc	115 Vac (60 Hz)	115 Vac (60 Hz)	
Std. Stroke Lengths (inch)	1 to 11.8 in (25 mm to 300 mm)	4, 8, 12, 24 in (101, 203, 304, 608 mm)	2, 4, 6, 8, 10, 12 in (50, 101, 152, 203, 254, 304 mm)	2, 4, 6, 8, 10, 12 in (50, 101, 152, 203, 254, 304 mm)	3, 6, 12, 18 in (76, 152, 304, 457 mm)	3, 6, 12, 18 in (76, 152, 304, 457 mm)	3, 6, 12, 18 in (76, 152, 304, 457 mm)	3, 6, 12, 18 in (76, 152, 304, 457 mm)	
	Custom Lengths Available								
Max Speed at Rated Load	Up to 1.3 in/s (33 mm/s)	Up to .26 in/s (6.6 mm/s)	Up to 1 in/s (25.4 mm/s)	Up to .75 in/sec (19 mm/s)	Up to 2 in/s (50 mm/s)	Up to 2 in/sec (50 mm/s)	Up to 1.4 in/s (35.5 mm/s)	Up to 1.4 in/s (35.5 mm/s)	
Load Limiting Clutch	N/A	N/A	n/a	n/a	n/a	Yes	n/a	Yes	
Limit Switches	Fixed	Adjustable	Optional	Optional	Adjustable	n/a	Adjustable	n/a	
Feedback	Hall effect sensor or potentiometer optional	N/A	Optional	Optional	Optional	n/a	Optional	n/a	
Current Draw at Rated Load	3.5 A (12vdc) 2.0 A (24vdc)	10 A (12vdc) 1.6 A (115 Vac)	7 A (12vdc) 5 A (24vdc)	7 A (12vdc) 5 A (24vdc)	28 A	28 A	5:00 AM	5.1 A	
Duty Cycle at Rated Load	Up to 900 in/hr (22,860 mm/hr)	17%	Up to 900 in/hr (22,860 mm/hr)	Up to 675 in/hr (17,145 mm/hr)	Up to 500 in/hr (12,700 mm/hr)	Up to 1,050 in/hr (26,670 mm/hr)	Up to 500 in/hr (12,700 mm/hr)	Up to 500 in/hr (12,700 mm/hr)	
Motor Overload Protection	N/A	AC motor thermal protection	n/a	n/a	Yes	Yes	Yes	Yes	
Environment	IP66	N/A	IP50	IP50	IP50 standard IP52 optional	IP50 standard IP52 optional	IP50 standard IP52 optional	IP50 standard IP52 optional	
Temperature Range	-13°F to 150°F (-25°C to 65°C)	32°F to 110°F (0°C to 43°C)	-20°F to 120°F (-28°C to 48°C)	-20°F to 120°F (-28°C to 48°C)	-20°F to 120°F (-28°C to 48°C)	-20°F to 120°F (-28°C to 48°C)	-20°F to 120°F (-28°C to 48°C)	-20°F to 120°F (-28°C to 48°C)	
Restraining Torque	Keyed	N/A	Keyed	Keyed	60 in-lbf (6.7 Nm)	60 in-lbf (6.7 Nm)	60 in-lbf (6.7 Nm)	60 in-lbf (6.7 Nm)	
Translating Tube Material	Polished Aluminum	Plated steel	Stainless Steel	Stainless Steel	Steel Zinc Chromate Plated	Steel Zinc Chromate Plated	Steel Zinc Chromate Plated	Steel Zinc Chromate Plated	
Options	Stainless steel translating tube Third limit switch	N/A	Adjustable Limit Switches Pulse Generator Feedback	Adjustable Limit Switches Pulse Generator Feedback	Potentiometer Weather Sealant Bellows Boot	Weather Sealant Bellows Boot	Potentiometer Capacitor Weather Sealant Capacitor Enclosure Bellows Boot	Capacitor Weather Sealant Capacitor Enclosure Bellows Boot	
Catalog Sheet pdf code	LT	LS	TMD01	TMD02	HMPDLS	HMPDC	HMPB250	HSPB	
Catalog Page	12-13	14-17	18-19	20-21	22-23	24-25	26-27	28-29	

	MPD	HMPB	SPB	TAC	TAL	LSPD	SPA	SPA
	500 lb (2,224 N)	500 lb (2,224 N)	500 lb (2,224 N)	500 lb (2,224 N)	1,000 lb (4,448 N)	1,500 lb (6,672 N)	1,500 lb (6,672 N)	2,000 lb (8,896 N)
								
	12 Vdc or 24 Vdc	115Vac (60 Hz)	115 Vac (60 Hz) or 220 Vac (50 Hz)	12 Vdc or 24 Vdc	115 Vac (60 Hz) or 220/230 Vac (50/60Hz)	12 Vdc or 24 Vdc	115 Vac (60 Hz) or 220 Vac (50 Hz)	115 Vac (60 Hz) or 220 Vac (50 Hz)
	3, 6, 12, 18 in (76, 152, 304, 457 mm)	3, 6, 12, 18 in (76, 152, 304, 457 mm)	3, 6, 12, 18 in (76, 152, 304, 457 mm)	3, 6, 12, 18 in (76, 152, 304, 457 mm)	4 (101.6), 8 (203.2), 12 (304.8)	3, 6, 12, 18, 24 in (76, 152, 304, 457, 608 mm)	3, 6, 12, 18, 24 in (76, 152, 304, 457, 608 mm)	3, 6, 12, 18, 24 in (76, 152, 304, 457, 608 mm)
	Custom Lengths Available							
	Up to 0.85 in/s (21.5 mm/s)	Up to 1.33 in/s (33.7 mm/s)	Up to 1.3 in/s (33.0 mm/s)	Up to 0.45 in/s (11.4 mm/s)	Up to 0.45 in/s (.36 mm/s)	Up to 0.43 in/s (10.9 mm/s)	Up to 0.83 in/s (21.0 mm/s)	Up to 0.86 in/s (21.8 mm/s)
	Available upon request	Available upon request	Yes	Yes	Available upon request	Available upon request	N/A	N/A
	Adjustable	Adjustable	N/A	N/A	Adjustable	Adjustable	Adjustable	Adjustable
	Potentiometer	Potentiometer	N/A	N/A	Potentiometer	Potentiometer	Potentiometer	Potentiometer
	23 A (12 Vdc) or 12 A (24 Vdc)	5.5 A	2.1 A (115 Vac,60 Hz) 1 A (220 Vac,50 Hz) 5.5 A (115Vac,60 Hz) high Speed motor	10 A (12 Vdc) or 5 A (24 Vdc)	4 A (115 Vac) or 2.0/2.5 A (220/230 Vac)	27 A	6.5 A (115 Vac) 2 A (220 Vac,50 Hz)	up to 5.1 A
	Up to 510 in/hr (12,954 mm/hr)	Up to 510 in/hr (12,954 mm/hr)	Up to 500 in/hr (12,700 mm/hr)	40%	17.5% (115 Vac) or 17%/14% (220/230)	410 in/hr (10,414 mm/hr)	up to 600 in/hr (15,240 mm/hr)	up to 600 in/hr (15,240 mm/hr)
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	IP50 standard IP52 optional	IP50 standard IP52 optional	IP50 standard IP52 optional	IP50 standard IP52 optional	IP50	IP50, IP52 optional	IP50, IP52 optional	IP50 standard IP52 optional
	-20°F to 120°F (-28°C to 48°C)	-20°F to 120°F (-28°C to 48°C)	-20°F to 120°F (-28°C to 48°C)	-20°F to 120°F (-28°C to 48°C)	-20°F to 120°F (-28°C to 48°C)	-20°F to 120°F (-28°C to 48°C)	15°F to 120°F (-9°C to 48°C)	15°F to 120°F (-9°C to 48°C)
	60 in-lbf (6.7 Nm)	60 in-lbf (6.7 Nm)	60 in-lbf (6.7 Nm)	40 in-lbf (4.5 Nm)	80 in-lbf (9 Nm)	215 in-lbf (24.2 Nm)	215 in-lbf (24.2 Nm)	180 in-lbf (20.3 Nm)
	Steel Zinc Chromate Plated	Steel Zinc Chromate Plated	Steel Zinc Chromate Plated	Stainless Steel	Stainless Steel	Steel Zinc Chromate Plated	Steel Zinc Chromate Plated	Steel Zinc Chromate Plated
	Potentiometer Weather Resistant Bellows Boot	Weather Resistant Bellows Boot Capacitor Capacitor Enclosure	Weather Resistant Capacitor Capacitor Enclosure Bellows Boot	Bellows Boot	Bellows Boot	Potentiometer Bellows Boot Weather Resistant	Bellows Boot Weather Resistant	Threaded end Weather Resistant Trunnion Mounting Bellows Boot
	MPD	HMPB500	SPB	TAC	TAL	LSPD	SPA1500	SPA2000
	30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45

QUICK REFERENCE

Series	SCW02	SCW03	SCW05	SCW10	SCW20	
Capacity	4,000 lb (17,792 N)	6,000 lb (26,689 N)	10,000 lb (44,482 N)	20,000 lb (88,964 N)	35,000 lb (155,687 N)	
Product Image						
Voltages	230/460 Vac Standard	230/460 Vac Standard	230/460 Vac Standard	230/460 Vac Standard	230/460 Vac Standard	
Std. Stroke Lengths (inch)	6, 12, 18, 24, 36 in (152, 304, 457, 609, 914 mm)	6, 12, 18, 24, 36 in (152, 304, 457, 609, 914 mm)	6, 12, 18, 24, 36 in (152, 304, 457, 609, 914 mm)	6, 12, 18, 24, 36 in (152, 304, 457, 609, 914 mm)	6, 12, 18, 24, 36 in (152, 304, 457, 609, 914 mm)	
	Custom Lengths Available					
Max Speed at Rated Load	Up to 72 in/s (1,828 mm/s)	Up to 119 in/s (3,022 mm/s)	Up to 135.6 in/s (3,444 mm/s)	Up to 108 in/s (2,743 mm/s)	Up to 21.6 in/s (548 mm/s)	
LimitSwitches (adjustable)	Standard	Standard	Standard	Standard	Standard	
Feedback	Optional	Optional	Optional	Optional	Optional	
Motor Overload Protection	Optional	Optional	Optional	Optional	Optional	
Temperature Range	0°F to 120°F (-18°C to 50°C)	0°F to 120°F (-18°C to 50°C)	0°F to 120°F (-18°C to 50°C)	0°F to 120°F (-18°C to 50°C)	0°F to 120°F (-18°C to 50°C)	
Translating Tube Material	Hard Chrome Plated	Hard Chrome Plated	Hard Chrome Plated	Hard Chrome Plated	Hard Chrome Plated	
Options	Trunnion Mounting Bellows Boot	Trunnion Mounting Bellows Boot	Trunnion Mounting Bellows Boot	Trunnion Mounting Bellows Boot	Trunnion Mounting Bellows Boot	
Catalog Sheet pdf code	SCW02	SCW03	SCW05	SCW10	SCW20	
Catalog Page	54-55	54-55	56-57	58-59	60-61	

	SCW25	SCN03	SCN06	SCN12	SCN25
	50,000 lb (222,411 N)	6,000 lb (26,689 N)	12,000 lb (53,378 N)	24,000 lb (106,752 N)	50,000 lb (222,409 N)
					
	230/460 Vac Standard	230/460 Vac Standard	230/460 Vac Standard	230/460 Vac Standard	230/460 Vac Standard
	6, 12, 18, 24, 36 in (152, 304, 457, 609, 914 mm)	6, 12, 18, 24, 36 in (152, 304, 457, 609, 914 mm)	6, 12, 18, 24, 36 in (152, 304, 457, 609, 914 mm)	6, 12, 18, 24, 36 in (152, 304, 457, 609, 914 mm)	6, 12, 18, 24, 36 in (152, 304, 457, 609, 914 mm)
	Custom Lengths Available				
	Up to 19.8 in/s (502 mm/s)	Up to 182.4 in/s (4,633 mm/s)	Up to 379.5 in/s (9,639 mm/s)	Up to 188.5 in/s (4,787 mm/s)	Up to 259.7 in/s (6,596 mm/s)
	Standard	Standard	Standard	Standard	Standard
	Optional	Optional	Optional	Optional	Optional
	Optional	Optional	Optional	Optional	Optional
	0°F to 120°F (-18°C to 50°C)	0°F to 120°F (-18°C to 50°C)	0°F to 120°F (-18°C to 50°C)	0°F to 120°F (-18°C to 50°C)	0°F to 120°F (-18°C to 50°C)
	Hard Chrome Plated	Hard Chrome Plated	Hard Chrome Plated	Hard Chrome Plated	Hard Chrome Plated
	Trunnion Mounting Bellows Boot	Bellows Boot	Bellows Boot	Bellows Boot	Bellows Boot
	SCW25	SCN03	SCN06	SCN12	SCN25
	62-63	64-67	68-71	72-75	76-79

APPLICATIONS

Tilt / Pivot

Duff-Norton linear actuators can be used to tilt objects, fixed at one end, up to 180° from their starting positions. The extension and retraction of the actuator causes the object to pivot about its stationary end.



Portable Lighting

PROBLEM: Movie and construction crews need portable lighting for work at night. Lighting that is compact for travel and easily erected on location was difficult to find.

SOLUTION: Duff-Norton linear actuators mounted to the skeleton of the lighting system, allows the lights to be drawn flush against the vehicle, then fully extended on location at the flip of a switch. Additional actuators adjust the angle of the lighting fixtures

Lift / Lower

Duff-Norton linear actuators can handle any lifting and lowering application up to 2000 lbs (910 kgs). As the translating tube of the actuator extends and retracts, the object that the actuator is attached to is raised and lowered at a consistent speed.



Drill Press Table

PROBLEM: When work pieces of different sizes require manual machining, it is necessary to adjust the height of the drill press table. Adjusting the height of the table manually is both time consuming and fatiguing.

SOLUTION: A Duff-Norton linear actuator mounted under the table allows the operator to change the height of the table as often as needed using either hand or foot controls.

Position

When an application requires periodic adjustment to the position of an object or objects, Duff-Norton linear actuators provide the solution. The motion of the actuator allows the operator to position an object by simply pushing a button.



Engine Assembly Fixture

PROBLEM: Fixture must be highly adjustable to specific positions for different procedures. The movement of the fixture must be smooth and reliable.

SOLUTION: Duff-Norton linear actuators are used to raise and lower the assembly fixture. This saves assembly time, reduces employee fatigue and work related injuries.

Roll / Slide

When it is necessary to roll or slide an object or a mechanical assembly into position, a Duff-Norton linear actuator is the answer. The movement of the actuator causes the clamping, rolling or sliding of the desired object.



Drum / Barrel Lifter

PROBLEM: Hazardous material sealed in drums must be handled and processed for disposal. It is desirable to minimize human involvement in the process.

SOLUTION: Two Duff-Norton linear actuators are used in each assembly. One operates a set of ratchet clamps that securely grasp the drum. The other actuator lifts the drum for pouring.

Open / Close

A Duff-Norton linear actuator mounted on a door, gate, or valve allows opening and closing operations on either a timed, or on-demand basis. As the actuator retracts, the gate is opened at a steady rate; the extension of the actuator returns the gate to a closed position.



Industrial Oven

PROBLEM: Industrial oven doors can be very large and must often be opened and closed on a timed basis to allow for steady flow of material in and out.

SOLUTION: A Duff-Norton linear actuator is connected to the oven door and operated by an electronic control system. The actuator opens and closes the door to allow materials to enter and exit when prompted by the control system.

Tension

Duff-Norton linear actuators offer a perfect solution for applications in which tension on a conveyor or web must be maintained and adjusted. An actuator mounted on a frame or roller extends and retracts to control the tension in the system.



Conveyor System

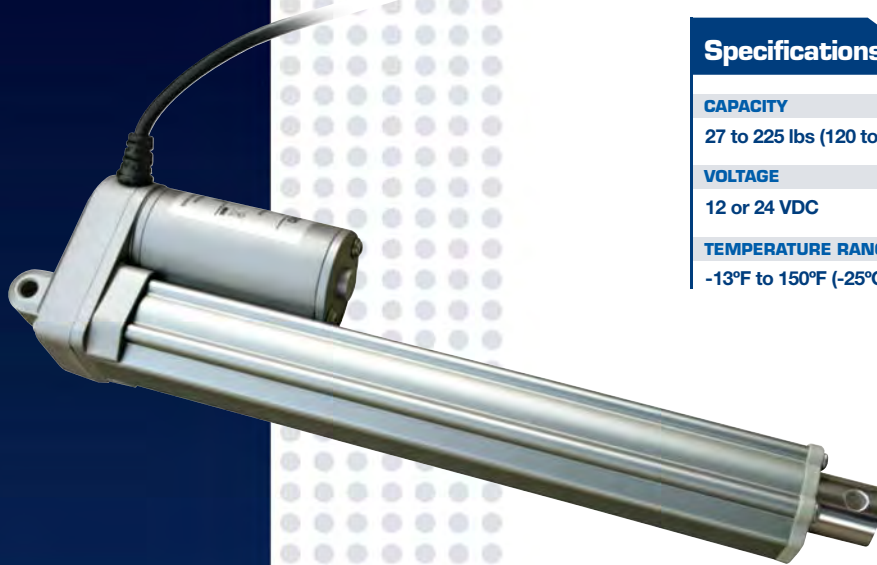
PROBLEM: The tension in conveyor belts must frequently be adjusted to allow for crates of different sizes and to take up slack in the system that develops with use.

SOLUTION: A Duff-Norton linear actuator is mounted to a roller at one end of the conveyor system. At the push of a button, the actuator adjusts the position of the roller, controlling the tension in the entire system. Actuators can also be used to reposition conveyor systems.

LT SERIES

27 to 225 lbs

120 to 1,000 N



Specifications

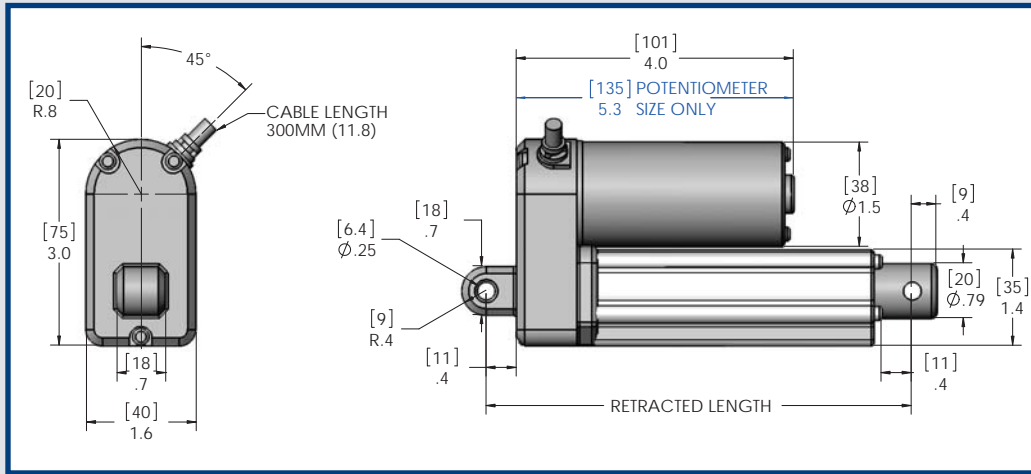
CAPACITY	STATIC LOAD
27 to 225 lbs (120 to 1,000N)	450 lbs (2,000 N)
VOLTAGE	STROKES
12 or 24 VDC	2 to 11.8 in (50 to 300 mm)
TEMPERATURE RANGE	ENVIRONMENT
-13°F to 150°F (-25°C to 65°C)	IP66 Protection

Features & Benefits

- Limit Switches - internal, factory preset
- Zinc Die Cast Housing for strength
- Aluminum outer tube for corrosion resistance
- Keyed translating tube to prevent rotation
- Polished aluminum translating tube for smooth operation
- Warranty - 1 year, parts and labor
- Gear Driven

Options

- Potentiometer, Hall Effect, Reed or Optical Feedback
- Signal sending Limit Switch
- Third Limit Switch
- Stainless steel translating tube
- Custom cable lengths
- Wired or wireless handsets
- AC power supply for multiple actuators
- AC controller for synchronous operation
- Custom design models



LT Linear Actuators

Product Information

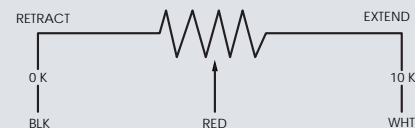
Part Number	Rated Load lbs (N)	Stroke Lengths		Retracted Length		Voltage Vdc	Current Draw at Rated Load amp	Lifting Speed at Rated Load		Limit Switch	Duty Cycle at Rated Load
		in	mm	in	mm			in/s	mm/s		
LT25-*-50	27 lbs (120N)	2	50	6.1	155	12 or 24	2.5 (12 Vdc) 1.5 (24 Vdc)	1.3	33	Yes	20%
LT25-*-100		4	100	8	205						
LT25-*-150		5.9	150	10	255						
LT25-*-200		7.9	200	12	307						
LT25-*-250		9.8	250	14	357						
LT25-*-300		11.8	300	16	407						
LT50-*-50	54 lbs (240N)	2	50	6.1	155	12 or 24	3.5 (12 Vdc) 2.0 (24 Vdc)	0.9	23	Yes	20%
LT50-*-100		4	100	8	205						
LT50-*-150		5.9	150	10	255						
LT50-*-200		7.9	200	12	307						
LT50-*-250		9.8	250	14	357						
LT50-*-300		11.8	300	16	407						
LT100-*-50	112 lbs (500N)	2	50	6.1	155	12 or 24	3.5 (12 Vdc) 2.0 (24 Vdc)	0.5	12	Yes	20%
LT100-*-100		4	100	8	205						
LT100-*-150		5.9	150	10	255						
LT100-*-200		7.9	200	12	307						
LT100-*-250		9.8	250	14	357						
LT100-*-300		11.8	300	16	407						
LT150-*-50	169 lbs (750N)	2	50	6.1	155	12 or 24	3.5 (12 Vdc) 2.0 (24 Vdc)	0.3	8	Yes	20%
LT150-*-100		4	100	8	205						
LT150-*-150		5.9	150	10	255						
LT150-*-200		7.9	200	12	307						
LT150-*-250		9.8	250	14	357						
LT150-*-300		11.8	300	16	407						
LT225-*-50	225 lbs (1,000N)	2	50	6.1	155	12 or 24	3.5 (12 Vdc) 2.0 (24 Vdc)	0.2	6	Yes	20%
LT225-*-100		4	100	8	205						
LT225-*-150		5.9	150	10	255						
LT225-*-200		7.9	200	12	307						
LT225-*-250		9.8	250	14	357						
LT225-*-300		11.8	300	16	407						

*Voltage: 1=12Vdc and 2=24Vdc

Contact factory for potentiometer models

Potentiometer / Hall Sensor Model

Stroke Length	50 mm*	100 mm*	150 mm*	200 mm*	250 mm*	300 mm
	1.9 in	3.9 in	5.9 in	7.9 in	7.9 in	11.8 in.
Retracted Length mm (in)	189 (7.4)	239 (9.4)	289 (11.4)	341 (13.4)	391 (15.4)	441 (17.4)
Extended Length mm (in)	239 (9.4)	339 (13.3)	439 (17.3)	541 (21.3)	641 (25.2)	741 (29.2)

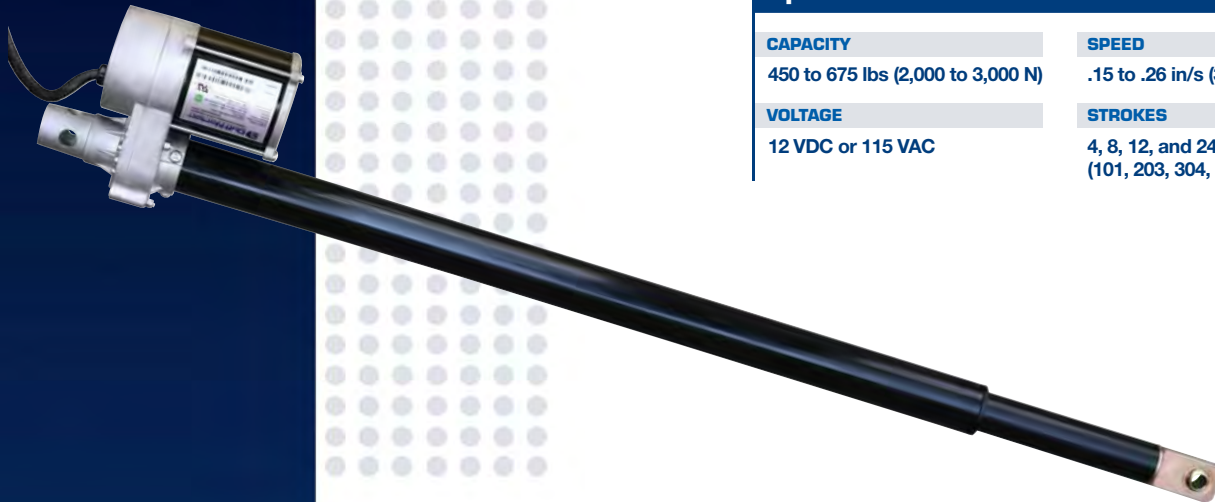
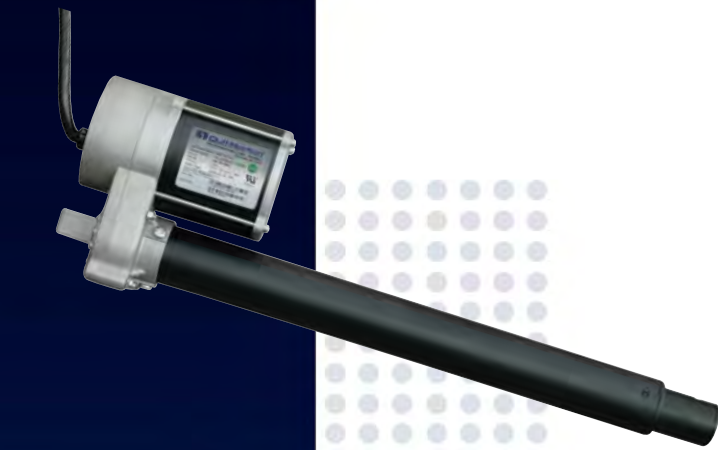


Potentiometer Stroke mm (in)	50 (1.97)	100 (3.94)	150 (5.91)	200 (7.87)	250 (9.84)	300 (11.81)
POT Travel (% of 10K)	47%	50%	71%	94%	39%	47%

LS SERIES

450 to 675 lbs

2,000 to 3,000 N



Specifications

CAPACITY

450 to 675 lbs (2,000 to 3,000 N)

SPEED

.15 to .26 in/s (3.8 to 6.6 mm/s)

VOLTAGE

12 VDC or 115 VAC

STROKES

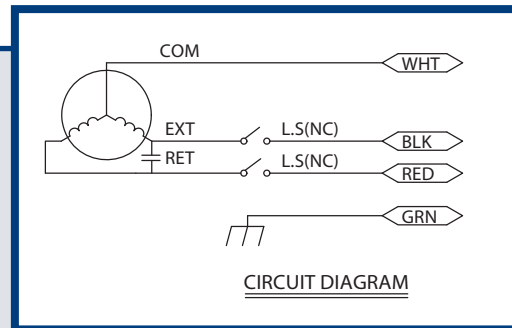
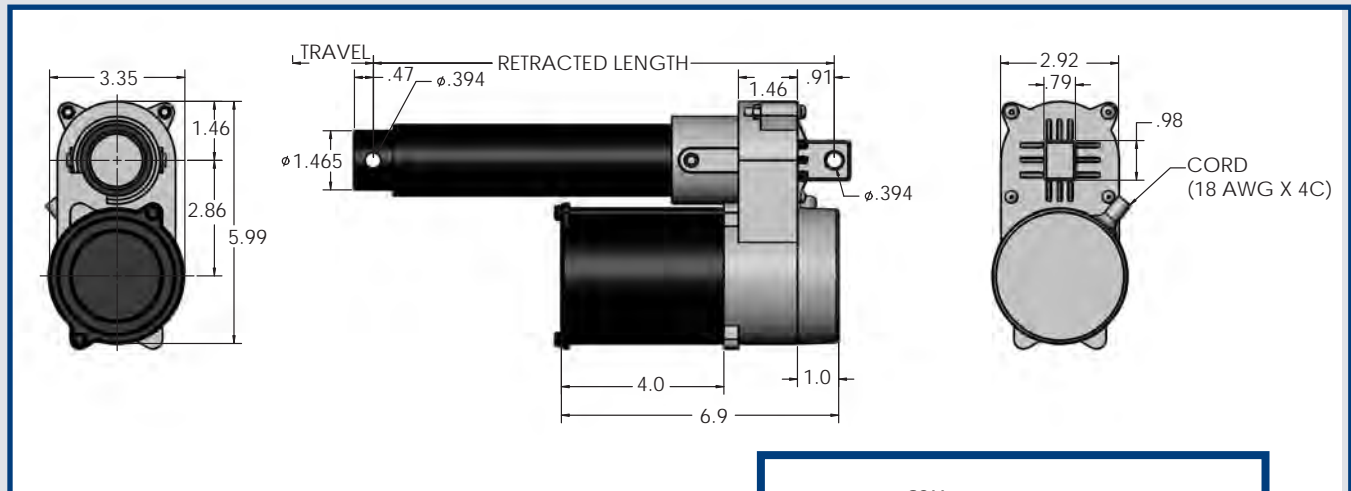
4, 8, 12, and 24 in
(101, 203, 304, and 609 mm)

Features & Benefits

- Loading: tension (pull) or compression (push) at rated load
- AC motor thermal protection to prevent over heating
- Internal limit switches - Adjustable
- Onboard capacitor for AC models
- Die cast aluminum housing for strength
- Steel translating tube and outer tube
- Self locking acme screw to prevent back driving
- CE compliant and UL recognized
- Custom models available



LS 25, 26 & 28



LS 25, 26 & 28 Linear Actuators

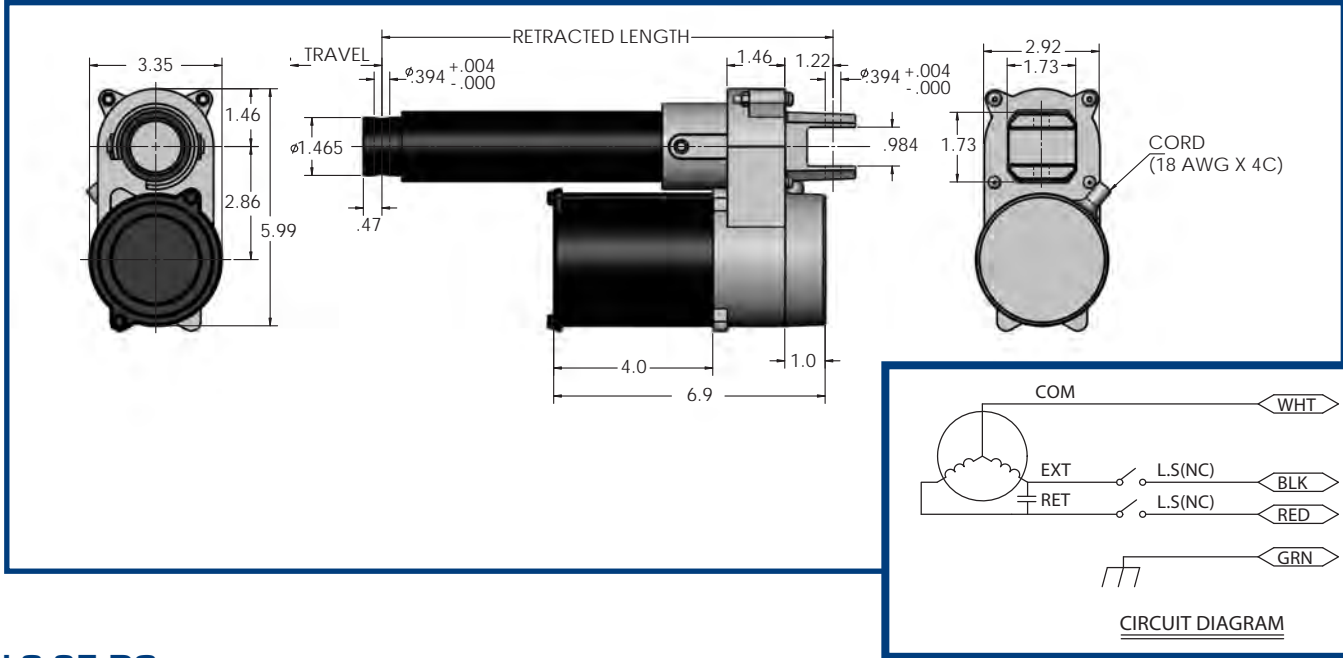
Part Number	Rated Load		Stroke		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed		Duty Cycle at Rated Load	Shipping Weight	
	lbs	N	in	mm	in	mm			in/s	mm/s		lbs	kg
LS25-1B5TN-04	450	2,000	4	101	11.4	290	115 Vac	1.4	0.26	6.6	17%	9.1	4.1
LS25-1B5TN-08			8	203	15.4	391						9.8	4.4
LS25-1B5TN-12			12	304	19.4	493						10.6	4.8
LS26-1B5TN-04	560	2,491	4	101	11.4	290	115 Vac	1.4	0.21	5.3	17%	9.1	4.1
LS26-1B5TN-08			8	203	15.4	391						9.8	4.4
LS26-1B5TN-12			12	304	19.4	493						10.6	4.8
LS28-1B5TN-04	675	3,002	4	101	11.4	290	115 Vac	1.4	0.15	3.8	17%	9.1	4.1
LS28-1B5TN-08			8	203	15.4	391						9.8	4.4
LS28-1B5TN-12			12	304	19.4	493						10.6	4.8

Product Information

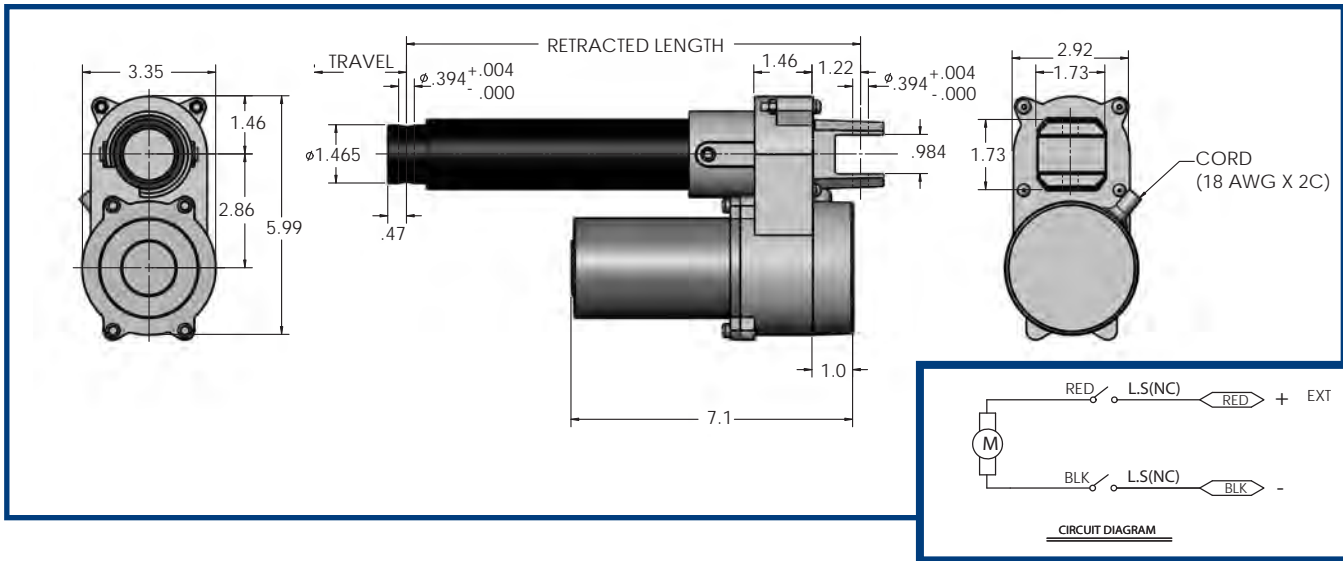
LS SERIES



LS 35 AC



LS 35 DC

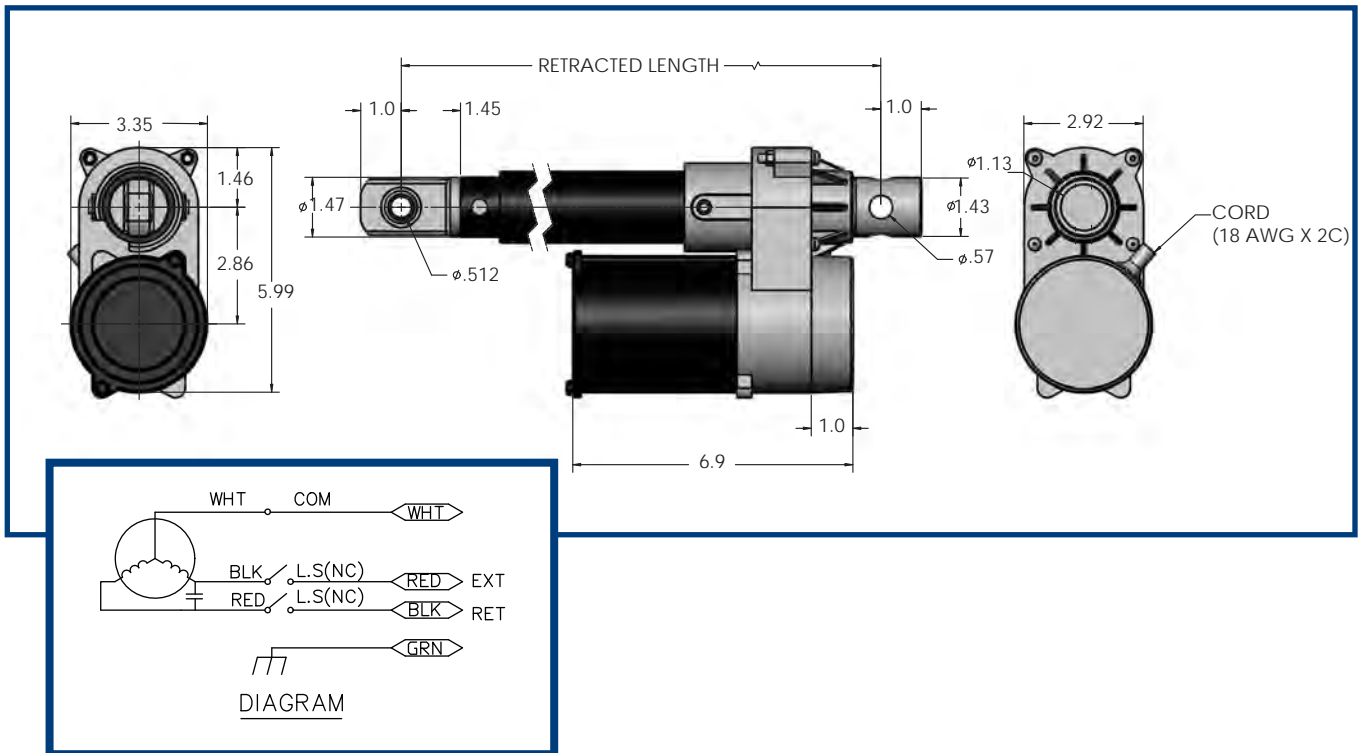


LS 35 Linear Actuators

Part Number	Rated Load		Stroke		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed		Duty Cycle at Rated Load	Shipping Weight	
	lbs	N	in	mm	in	mm			in/s	mm/s		lbs	kg
LS35-3B4TN-12	675	3,002	12	304	19.4	493	12Vdc	10	0.21	5.3	17%	8.6	3.9
LS35-3B4TN-24			24	609	31.4	797	12Vdc	10	0.21	5.3		10.8	4.9
LS35-1B4TN-12			12	304	19.4	493	115Vac	1.6	0.26	6.6		10.6	4.8
LS35-1B4TN-24			24	609	31.4	797	115Vac	1.6	0.26	6.6		12.8	5.8



LS 48



LS 48 Linear Actuators

Part Number	Rated Load		Stroke		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed		Duty Cycle at Rated Load	Shipping Weight	
	lbs	N	in	mm	in	mm			in/s	mm/s		lbs	kg
LS48-S001	660	2,935	24	609	38.8	984	115Vac	1.4	0.15	3.8	17%	21.6	9.8

TMD01 SERIES

100 lbs

444 N

Specifications

CAPACITY	STATIC LOAD
100 lbs (444 N)	300 lbs (1,332 N)
DESIGN	ENVIRONMENT
Acme Screw	IP50 Protection standard
TEMPERATURE RANGE	
-20°F to 120°F (-29°C to 50°C)	

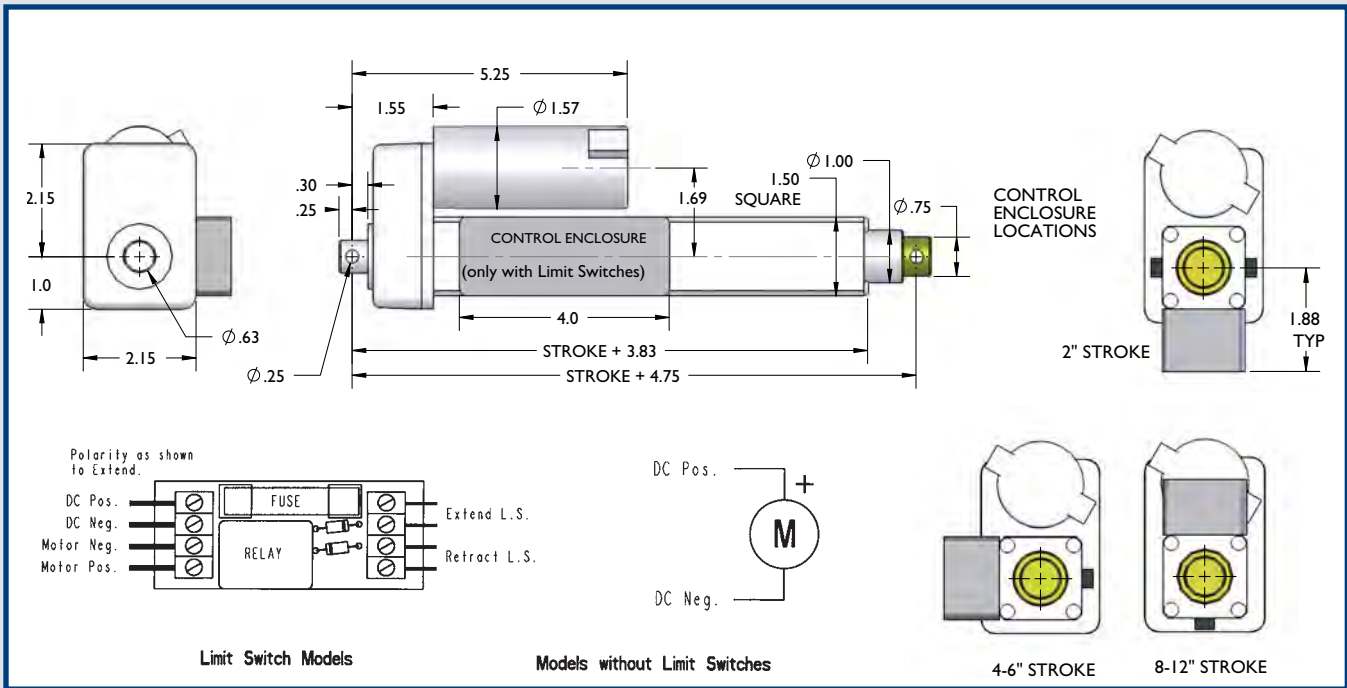


Features & Benefits

- Compact design
- Timing belt drive for quiet operation
- Aluminum housing and outer tube
- Low current draw
- Double clevis mounting
- Easy to wire terminal strip (limit switch models)
- Keyed translating tube
- Permanent magnet motors - no thermal overload protection

Options

- Adjustable Limit Switched - Includes control enclosure with fuse
- Pulse generator for feedback
(Add "PTD" prefix)



TMD01 Linear Actuator - 100 lb (444 N) Capacity

Product Information

Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Limit Switch	Duty Cycle at Rated Load	Shipping Weight	
	lbs	N	in	mm	in	mm			in/s	mm/s			lbs	kg
TMD01-1406-2	100	444	2	50	6.75	171	12Vdc	7	0.7	18	No Limit Switches	25%	4	1.8
TMD01-1406-4			4	101	8.75	222							4	1.8
TMD01-1406-6			6	152	10.75	273							5	2.3
TMD01-1406-8			8	203	12.75	323							5	2.3
TMD01-1406-10			10	254	14.75	374							5	2.3
TMD01-1406-12	12	304	16.75	425	5	2.3								
TMD01-1906-2	100	444	2	50	6.75	171	12Vdc	7	0.7	18	Adjustable Limit Switches	25%	4	1.8
TMD01-1906-4			4	101	8.75	222							4	1.8
TMD01-1906-6			6	152	10.75	273							5	2.3
TMD01-1906-8			8	203	12.75	323							5	2.3
TMD01-1906-10			10	254	14.75	374							5	2.3
TMD01-1906-12	12	304	16.75	425	5	2.3								
TMD01-2406-2	100	444	2	50	6.75	171	24Vdc	5	1	25	No Limit Switches	25%	4	1.8
TMD01-2406-4			4	101	8.75	222							4	1.8
TMD01-2406-6			6	152	10.75	273							5	2.3
TMD01-2406-8			8	203	12.75	323							5	2.3
TMD01-2406-10			10	254	14.75	374							5	2.3
TMD01-2406-12	12	304	16.75	425	5	2.3								
TMD01-2906-2	100	444	2	50	6.75	171	24Vdc	5	1	25	Adjustable Limit Switches	25%	4	1.8
TMD01-2906-4			4	101	8.75	222							4	1.8
TMD01-2906-6			6	152	10.75	273							5	2.3
TMD01-2906-8			8	203	12.75	323							5	2.3
TMD01-2906-10			10	254	14.75	374							5	2.3
TMD01-2906-12	12	304	16.75	425	5	2.3								

** For pulse generator models, use PTD model number prefix instead of TMD

TMD02 SERIES

250 lbs

1,112 N

Specifications

CAPACITY

250 lbs (1,112 N)

STATIC LOAD

300 lbs (1,332 N)

DESIGN

Acme Screw

ENVIRONMENT

IP50 Protection standard

TEMPERATURE RANGE

-20°F to 120°F (-29°C to 50°C)

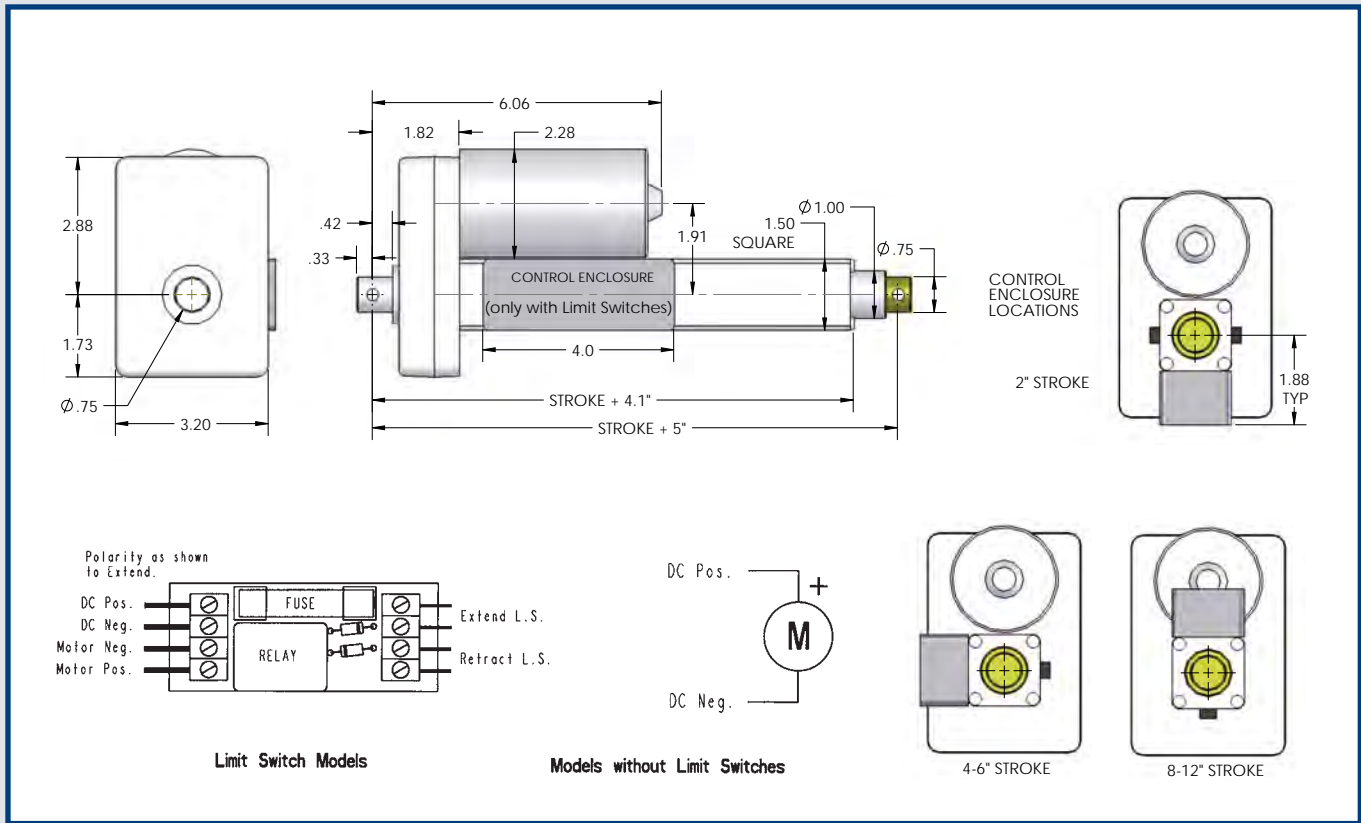


Features & Benefits

- Compact design
- Belt drive for quiet operation
- Aluminum housing and outer tube
- Stainless steel translating tube
- Double clevis mounting
- Easy to wire terminal strip (limit switch models)
- Keyed translating tube
- Permanent magnet motors - no thermal overload protection

Options

- Adjustable Limit Switches - Includes control enclosure with fuse
- Pulse generator for feedback
(Add "PTD" prefix)



TMD02 Linear Actuator - 250 lb (1,112 N) Capacity														
Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Limit Switch	Duty Cycle at Rated Load	Shipping Weight	
	lbs	N	in	mm	in	mm			in/s	mm/s			lbs	kg
TMD02-1406-2	250	1,112	2	50	7	177	12Vdc	7	0.4	10	No Limit Switches	25%	4	1.8
TMD02-1406-4			4	101	9	228							4	1.8
TMD02-1406-6			6	152	11	279							5	2.3
TMD02-1406-8			8	203	13	330							5	2.3
TMD02-1406-10			10	254	15	381							5	2.3
TMD02-1406-12			12	304	17	431							5	2.3
TMD02-1906-2	250	1,112	2	50	7	177	12Vdc	7	0.4	10	Independently Adjustable Limit Switches	25%	4	1.8
TMD02-1906-4			4	101	9	228							4	1.8
TMD02-1906-6			6	152	11	279							5	2.3
TMD02-1906-8			8	203	13	330							5	2.3
TMD02-1906-10			10	254	15	381							5	2.3
TMD02-1906-12			12	304	17	431							5	2.3
TMD02-2406-2	250	1,112	2	50	7	177	24Vdc	4.5	0.75	19	No Limit Switches	25%	4	1.8
TMD02-2406-4			4	101	9	228							4	1.8
TMD02-2406-6			6	152	11	279							5	2.3
TMD02-2406-8			8	203	13	330							5	2.3
TMD02-2406-10			10	254	15	381							5	2.3
TMD02-2406-12			12	304	17	431							5	2.3
TMD02-2906-2	250	1,112	2	50	7	177	24Vdc	4.5	0.75	19	Independently Adjustable Limit Switches	25%	4	1.8
TMD02-2906-4			4	101	9	228							4	1.8
TMD02-2906-6			6	152	11	279							5	2.3
TMD02-2906-8			8	203	13	330							5	2.3
TMD02-2906-10			10	254	15	381							5	2.3
TMD02-2906-12			12	304	17	431							5	2.3

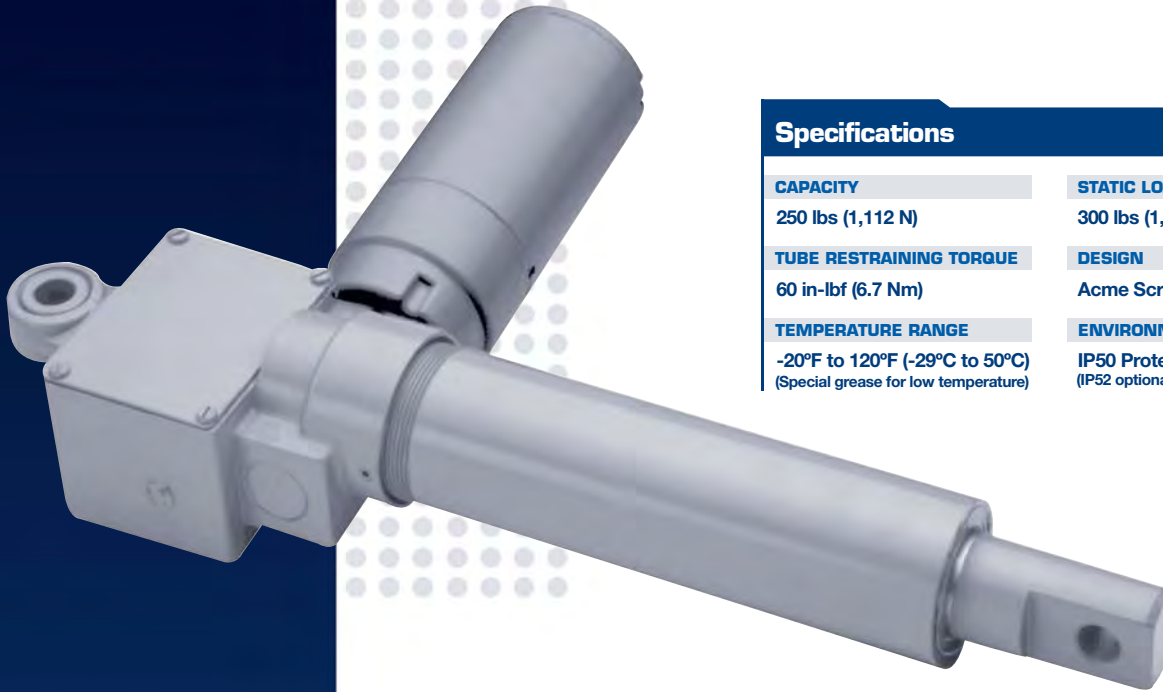
** For pulse generator models, use PTD model number prefix instead of TMD

HMPD SERIES

With Limit Switch

250 lbs

1,112 N



Specifications

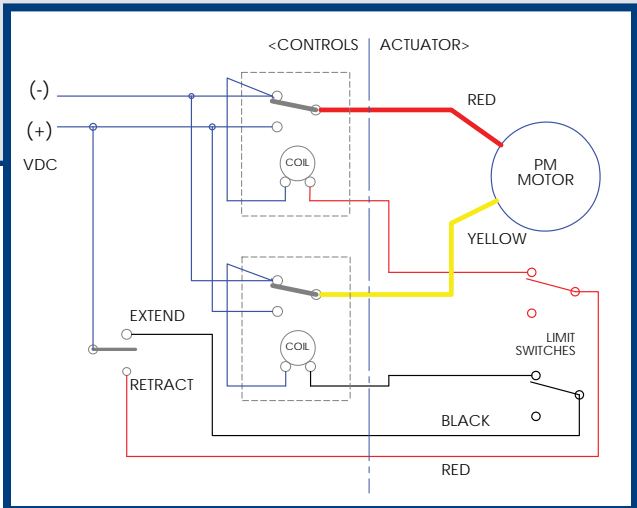
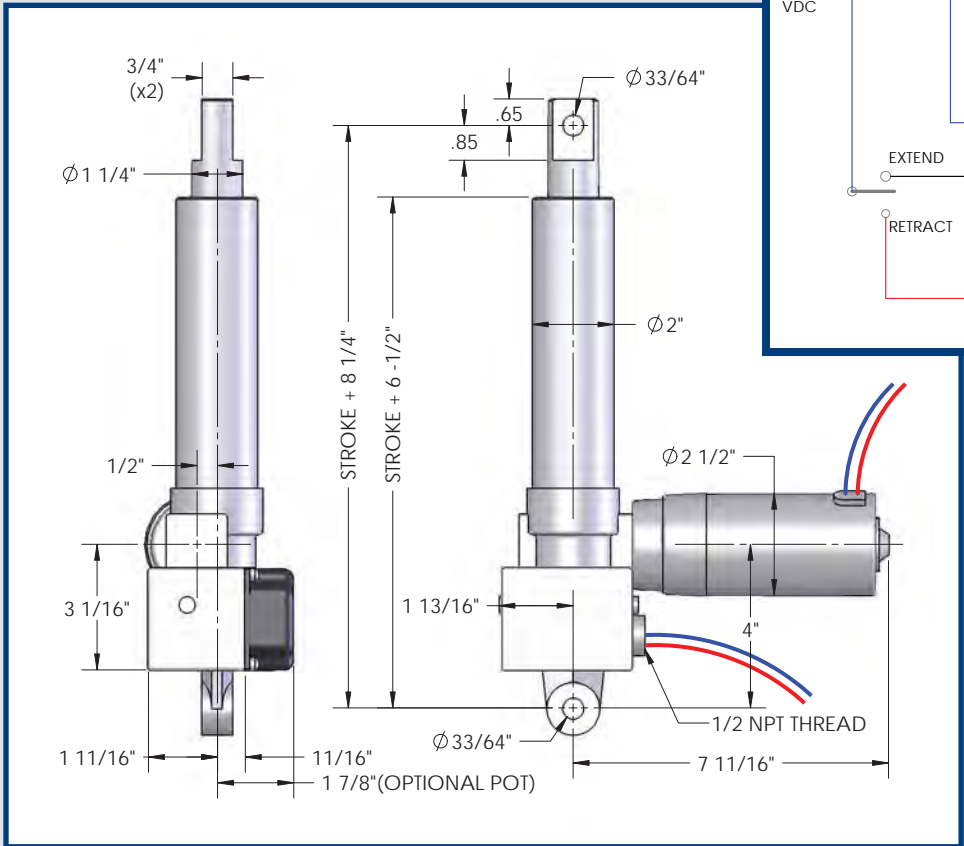
CAPACITY	STATIC LOAD
250 lbs (1,112 N)	300 lbs (1,332 N)
TUBE RESTRAINING TORQUE	DESIGN
60 in-lbf (6.7 Nm)	Acme Screw
TEMPERATURE RANGE	ENVIRONMENT
-20°F to 120°F (-29°C to 50°C) (Special grease for low temperature)	IP50 Protection standard (IP52 optional)

Features & Benefits

- Heavy duty design for long life in tough applications
- Aluminum housing and outer tube
- Steel translating tube – zinc chromate plated
- Double clevis mounting
- Spring Brake
- Internal adjustable limit switches
- Automatic reset thermal overload motor protection

Options

- Potentiometer Feedback (add “P” prefix)
- Weather Resistant Sealant –IP52 (add “W” prefix)
- Bellows Boot



Note:
(2) relays are required for DC limit switch models

HMPD Linear Actuator with limit switch - 250 lb (1,112 N) Capacity															
Product Information	Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Limit Switch	Duty Cycle at Rated Load	Shipping Weight	
		lbs	N	in	mm	in	mm			in/s	mm/s			lbs	kg
		MPD3905-3	250	1,112	3	76	11.25			285	12Vdc			14	1
MPD3905-6	6	152			14.25	362	12	5.4							
MPD3905-12	12	304			20.25	514	14	6.4							
MPD3905-18	18	457			26.25	666	17	7.7							
MPD3904-3	250	1,112	3	76	11.25	285	24Vdc	6	1.2	30	Yes	26%	10	4.5	
MPD3904-6			6	152	14.25	362							12	5.4	
MPD3904-12			12	304	20.25	514							14	6.4	
MPD3904-18			18	457	26.25	666							17	7.7	
HMPD3905-3	250	1,112	3	76	11.25	285	12Vdc	28	2	50	Yes	15%	10	4.5	
HMPD3905-6			6	152	14.25	362							12	5.4	
HMPD3905-12			12	304	20.25	514							14	6.4	
HMPD3905-18			18	457	26.25	666							17	7.7	

HMPD SERIES

With Clutch

250 lbs

1,112 N



Specifications

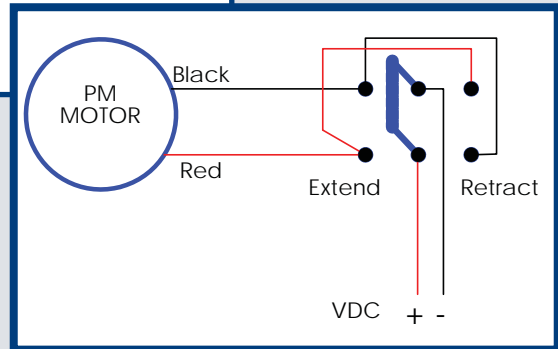
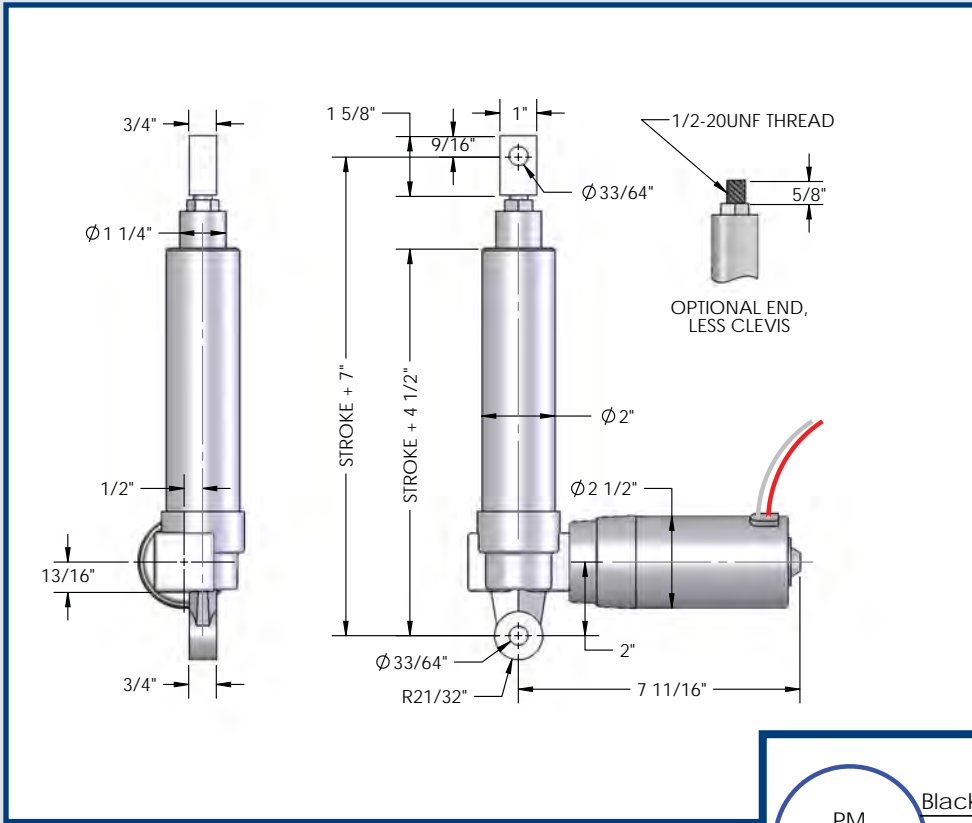
CAPACITY	STATIC LOAD
250 lbs (1,112 N)	300 lbs (1,332 N)
TUBE RESTRAINING TORQUE	DESIGN
60 in-lbf (6.7 Nm)	Acme Screw
TEMPERATURE RANGE	ENVIRONMENT
-20°F to 120°F (-29°C to 50°C) (Special grease for low temperature)	IP50 Protection standard (IP52 optional)

Features & Benefits

- Heavy duty design for long life in tough applications
- Aluminum housing and outer tube
- Steel translating tube – zinc chromate plated
- Double clevis mounting
- Patented Spring Brake
- Load limiting friction disc clutch
- Automatic reset thermal overload motor protection

Options

- Weather Resistant Sealant – IP52 (add “W” prefix)
- Bellows Boot
- 90 degree housing clevis mounting
- Threaded end (add “T” prefix)



HMPD Linear Actuator with Clutch - 250 lb (1,112 N) Capacity															
Product Information	Part Number		Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Duty Cycle at Rated Load	Shipping Weight	
			lbs	N	in	mm	in	mm			in/s	mm/s		lbs	kg
		MPD3405-3	250	1,112	3	76	11.25	285	12Vdc	14	1	25	21%	8	3.6
	MPD3405-6	6			152	14.25	362	10						4.5	
	MPD3405-12	12			304	20.25	514	12						5.4	
	MPD3405-18	18			457	26.25	666	15						6.8	
	MPD3404-3	250	1,112	3	76	11.25	285	24Vdc	5	1	25	32%	8	3.6	
	MPD3404-6			6	152	14.25	362						10	4.5	
	MPD3404-12			12	304	20.25	514						12	5.4	
	MPD3404-18			18	457	26.25	666						15	6.8	
	HMPD3405-3	250	1,112	3	76	11.25	285	12Vdc	28	2	50	12%	8	3.6	
	HMPD3405-6			6	152	14.25	362						10	4.5	
	HMPD3405-12			12	304	20.25	514						12	5.4	
	HMPD3405-18			18	457	26.25	666						15	6.8	

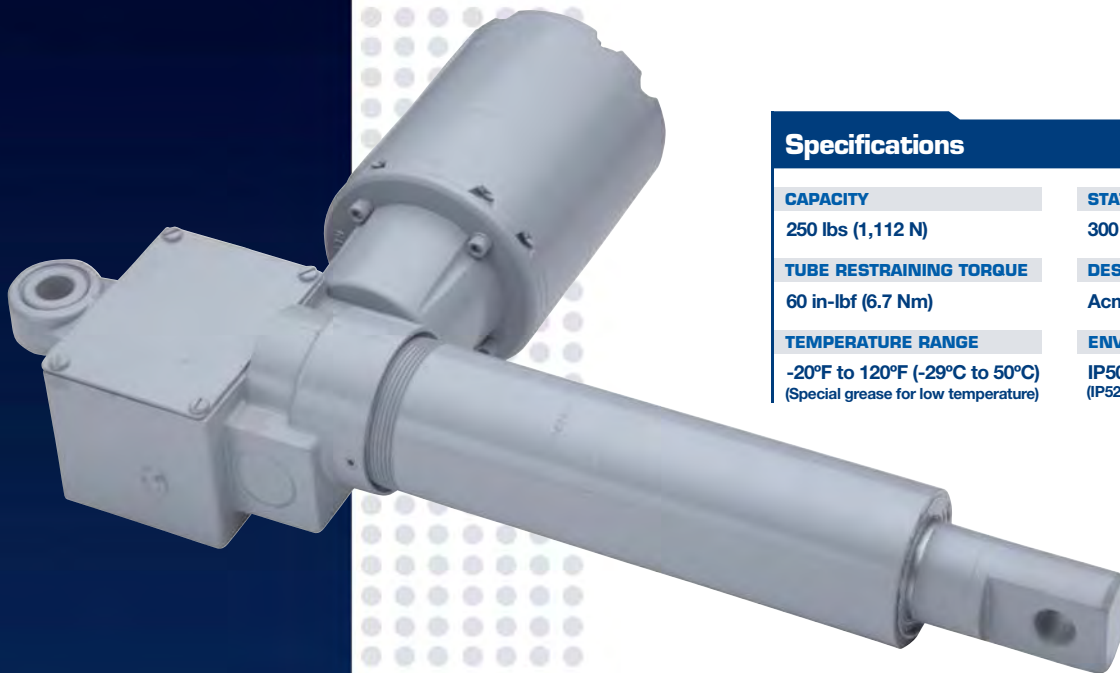
HMPB SERIES

250 lbs

1,112 N

Specifications

CAPACITY	STATIC LOAD
250 lbs (1,112 N)	300 lbs (1,332 N)
TUBE RESTRAINING TORQUE	DESIGN
60 in-lbf (6.7 Nm)	Acme Screw
TEMPERATURE RANGE	ENVIRONMENT
-20°F to 120°F (-29°C to 50°C) (Special grease for low temperature)	IP50 Protection standard (IP52 optional)

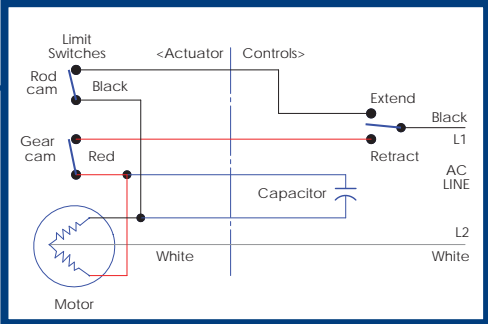
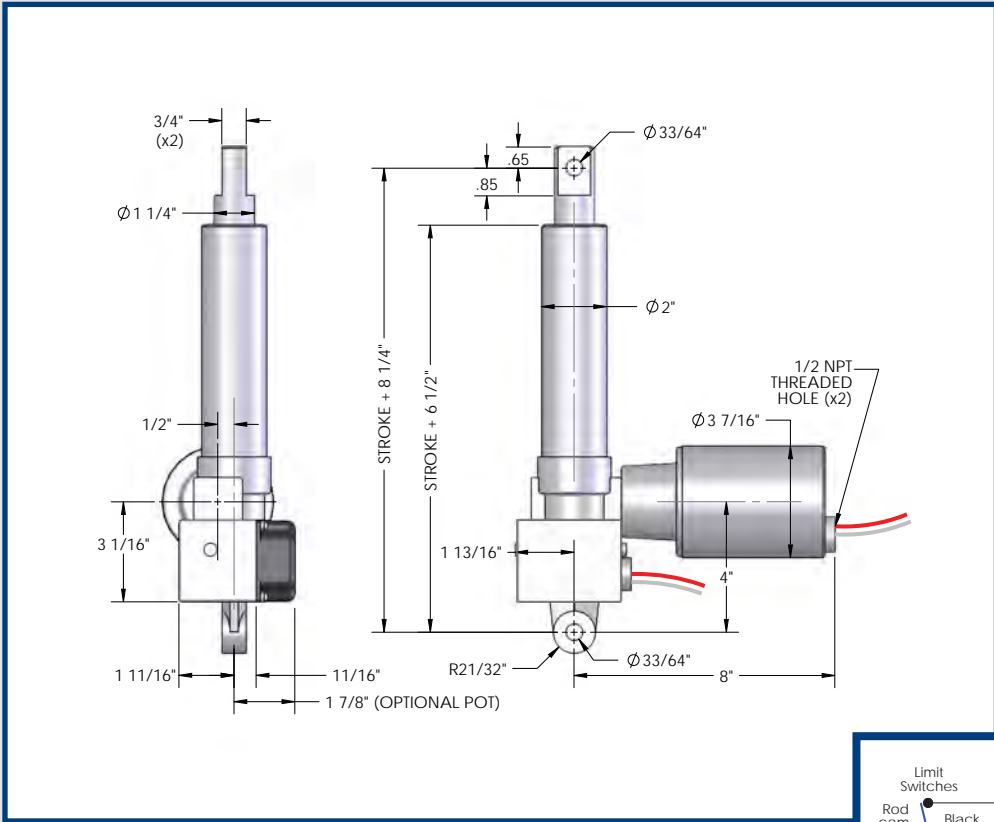


Features & Benefits

- Heavy duty design for long life in tough applications
- Aluminum housing and outer tube
- Steel translating tube – zinc chromate plated
- Double clevis mounting
- Bi-directional Ball Type Brake
- Internal adjustable limit switches
- Automatic reset thermal overload motor protection

Options

- Weather Resistant Sealant – IP52 (add “W” prefix)
- Potentiometer (add “P” prefix)
- Capacitor (see table)
- Bellows Boot



HMPB Linear Actuator with limit switch - 250 lb (1,112 N) Capacity														
Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Potentiometer	Duty Cycle at Rated Load	Shipping Weight	
	lbs	N	in	mm	in	mm			in/s	mm/s			lbs	kg
MPB3905-3	250	1,112	3	76	11.25	285	115 Vac (60 Hz)	2	0.7	18	No	23%	11	5.0
MPB3905-6			6	152	14.25	362							13	5.9
MPB3905-12			12	304	20.25	514							16	7.3
MPB3905-18			18	457	26.25	666							18	8.2
MPB4905-3	250	1,112	3	76	11.25	285	220 Vac (50 Hz)	1	0.6	15	No	21%	11	5.0
MPB4905-6			6	152	14.25	362							13	5.9
MPB4905-12			12	304	20.25	514							16	7.3
MPB4905-18			18	457	26.25	666							18	8.2
HMPB3905-3	250	1,112	3	76	11.25	285	115 Vac (60 Hz)	5	1.4	35	No	11%	11	5.0
HMPB3905-6			6	152	14.25	362							13	5.9
HMPB3905-12			12	304	20.25	514							16	7.3
HMPB3905-18			18	457	26.25	666							18	8.2
PHMPB3905-3	250	1,112	3	76	11.25	285	115 Vac (60 Hz)	5	1.4	35	Yes	10%	12	5.4
PHMPB3905-6			6	152	14.25	362							14	6.4
PHMPB3905-12			12	304	20.25	514							17	7.7
PHMPB3905-18			18	457	26.25	666							19	8.6

Note: A capacitor is required for all AC volt motors.

HSPB SERIES

250 lbs

1,112 N



Specifications

CAPACITY

250 lbs (1,112 N)

STATIC LOAD

300 lbs (1,332 N)

TUBE RESTRAINING TORQUE

60 in-lbf (6.7 Nm)

DESIGN

Acme Screw

TEMPERATURE RANGE

-20°F to 120°F (-29°C to 50°C)
(Special grease for low temperature)

ENVIRONMENT

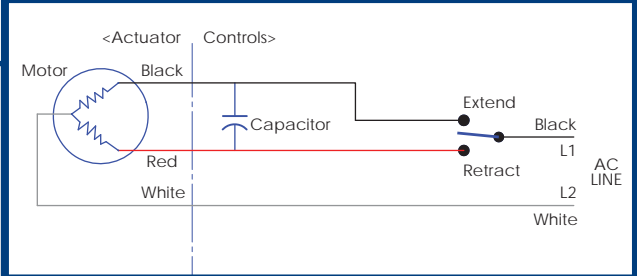
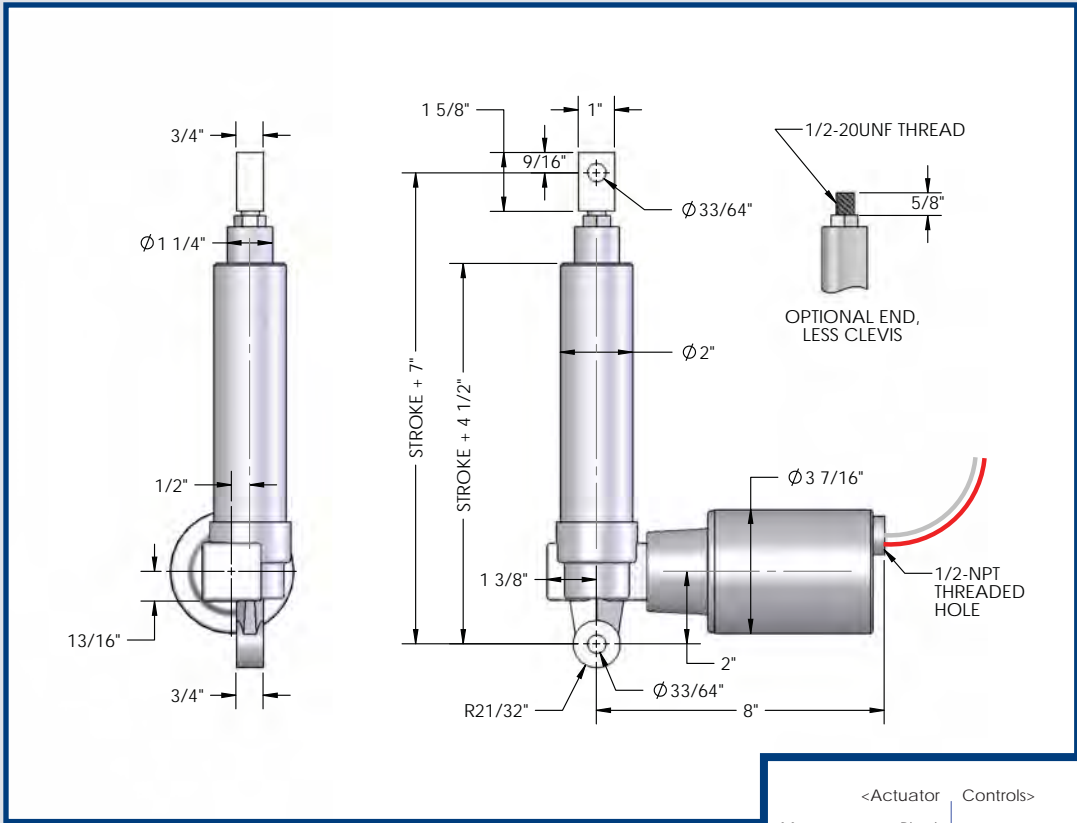
IP50 Protection standard
(IP52 optional)

Features & Benefits

- Heavy duty design for long life in tough applications
- Aluminum housing and outer tube
- Steel translating tube – zinc chromate plated
- Double clevis mounting
- Bidirectional Ball Type Brake
- Load limiting friction disc clutch
- Automatic reset thermal overload motor protection

Options

- Weather Resistant Sealant – IP52 (add “W” prefix)
- Capacitor (see table)
- Bellows Boot
- Thread end (add “T” prefix)



HSPB Linear Actuator with limit switch - 250 lb (1,112 N) Capacity

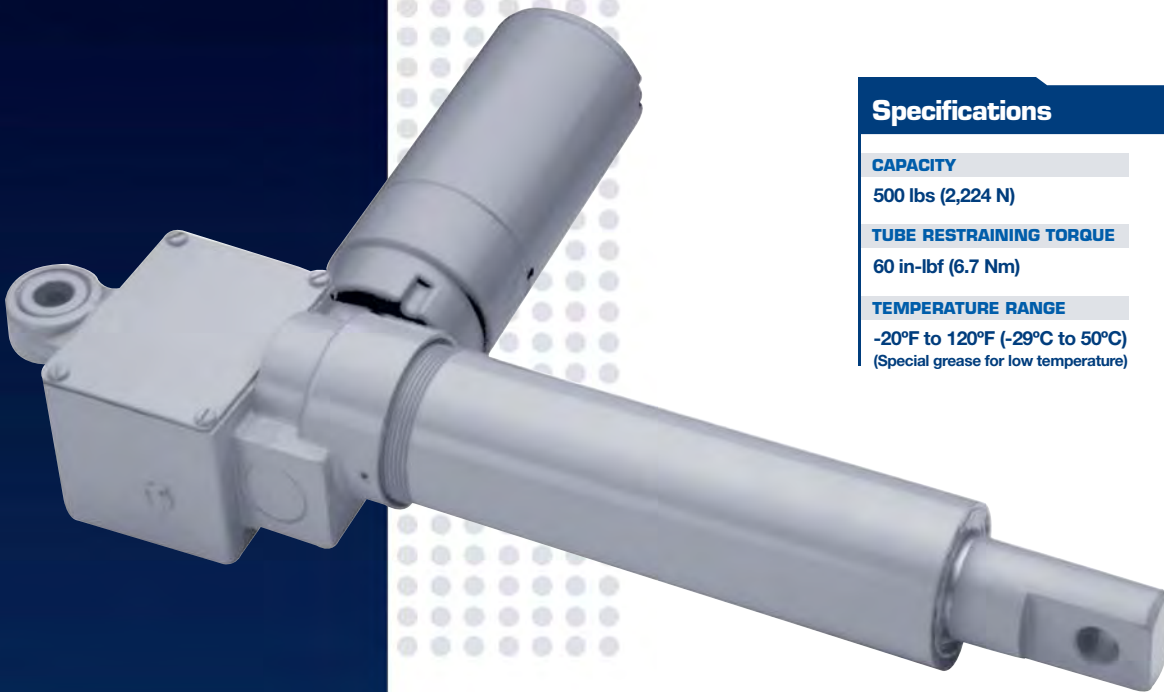
Product Information	Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Duty Cycle at Rated Load	Shipping Weight	
		lbs	N	in	mm	in	mm			in/s	mm/s		lbs	kg
	SPB3405-3	250	1,112	3	76	10	254	115 Vac (60 Hz)	1.9	0.7	18	24%	10	4.5
SPB3405-6	6			152	13	330	12						5.4	
SPB3405-12	12			304	19	482	14						6.4	
SPB3405-18	18			457	25	635	17						7.7	
SPB4405-3	250	1,112	3	76	10	254	220 Vac (50 Hz)	1	0.6	15	22%	10	4.5	
SPB4405-6			6	152	13	330						12	5.4	
SPB4405-12			12	304	19	482						14	6.4	
SPB4405-18			18	457	25	635						17	7.7	
HSPB3405-3	250	1,112	3	76	10	254	115 Vac (60 Hz)	5.1	1.4	36	10%	10	4.5	
HSPB3405-6			6	152	13	330						12	5.4	
HSPB3405-12			12	304	19	482						14	6.4	
HSPB3405-18			18	457	25	635						17	7.7	

Note: A capacitor is required for all AC volt motors.

MPD SERIES

500 lbs

2,224 N



Specifications

CAPACITY

500 lbs (2,224 N)

STATIC LOAD

750 lbs (3,336 N)

TUBE RESTRAINING TORQUE

60 in-lbf (6.7 Nm)

DESIGN

Acme Screw

TEMPERATURE RANGE

-20°F to 120°F (-29°C to 50°C)
(Special grease for low temperature)

ENVIRONMENT

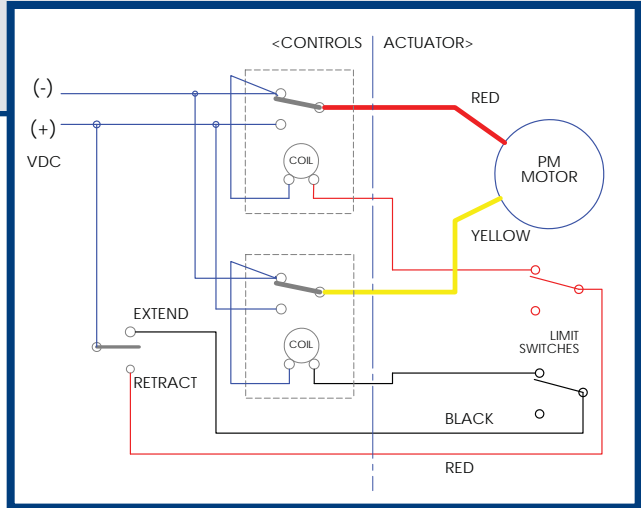
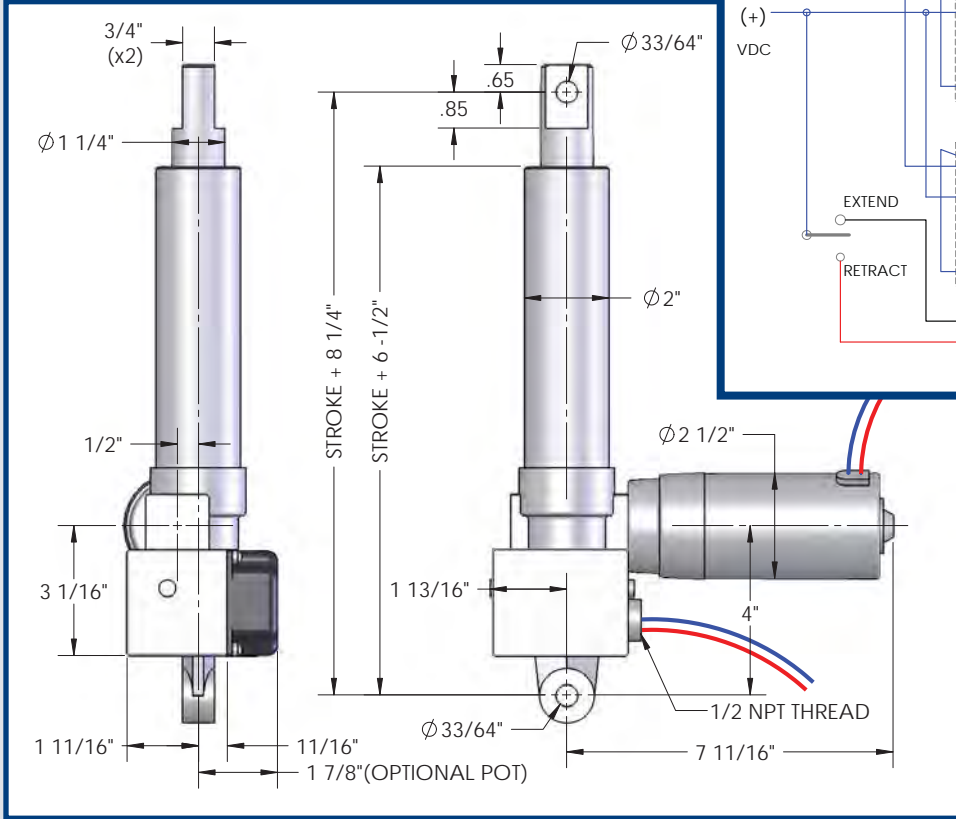
IP50 Protection standard
IP52 Optional

Features & Benefits

- Heavy duty design for long life in tough applications
- Patented Spring Brake
- Aluminum housing and outer tube
- Steel translating tube – zinc chromate plated
- Double clevis mounting
- Internal adjustable limit switches
- Automatic reset thermal overload motor protection

Options

- Weather Resistant Sealant – IP52 (add “W” prefix)
- Potentiometer Feedback (add “P” prefix)
- Bellows Boot
- Thread End



Note:

(2) relays are required for DC limit switch models

MPD Linear Actuator with limit switch - 500 lb (2,224 N) Capacity

Product Information	Part Number		Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Limit Switch	Duty Cycle at Rated Load	Shipping Weight	
	lbs	N	in	mm	in	mm	in/s	mm/s			lbs	kg				
	MPD6905-3	500	2,224	3	76	11.25	286	12 Vdc	23	0.75	19	Yes	19%	13	5.9	
MPD6905-6	6			152.4	14.25	362	15							6.8		
MPD6905-12	12			304.8	20.25	514	18							8.2		
MPD6905-18	18			457.2	26.25	667	20							9.1		
MPD6904-3	500	2,224	3	76	11.25	286	24 Vdc	12	0.85	22	Yes	17%	13	5.9		
MPD6904-6			6	152.4	14.25	362							15	6.8		
MPD6904-12			12	304.8	20.25	514							18	8.2		
MPD6904-18			18	457.2	26.25	667							20	9.1		

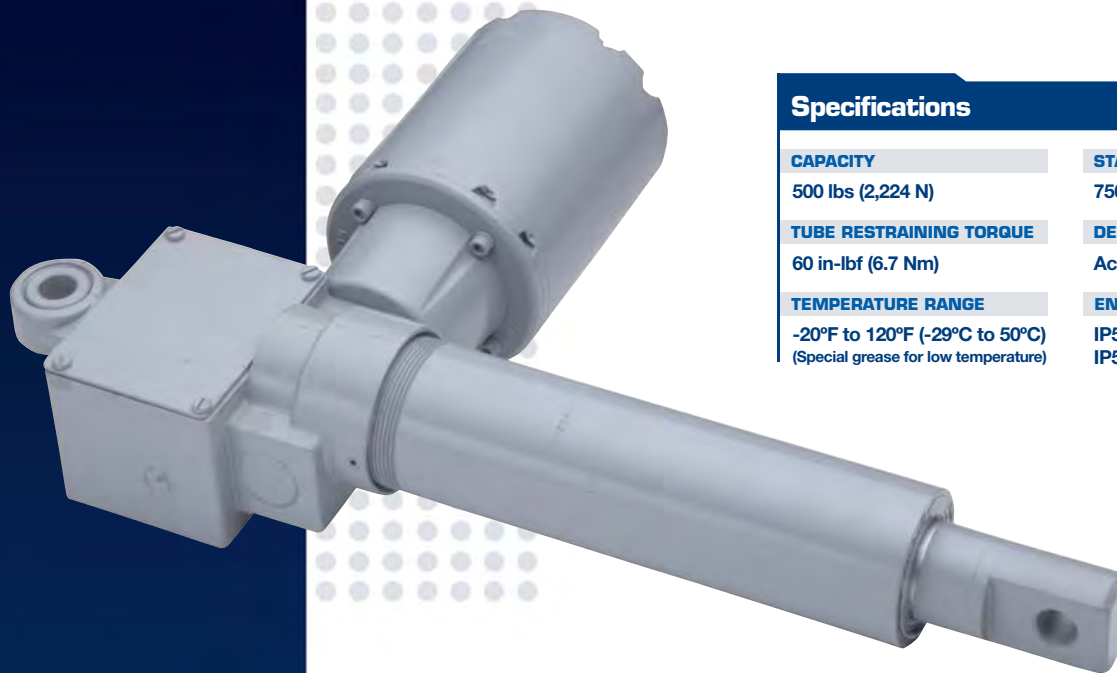
MPD Linear Actuator with clutch - 500 lb (2,224 N) Capacity

Product Information	Part Number		Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Limit Switch	Duty Cycle at Rated Load	Shipping Weight	
	lbs	N	in	mm	in	mm	in/s	mm/s			lbs	kg				
	MPD6405-3	500	2,224	3	76	11.25	286	12 Vdc	11	0.7	18	No	18%	13	5.9	
MPD6405-6	6			152.4	14.25	362	15							6.8		
MPD6405-12	12			304.8	20.25	514	18							8.2		
MPD6405-18	18			457.2	26.25	667	20							9.1		
MPD6404-3	500	2,224	3	76	11.25	286	24 Vdc	22	0.8	20	No	17%	13	5.9		
MPD6404-6			6	152.4	14.25	362							15	6.8		
MPD6404-12			12	304.8	20.25	514							18	8.2		
MPD6404-18			18	457.2	26.25	667							20	9.1		

HMPB SERIES

500 lbs

2,224 N



Specifications

CAPACITY

500 lbs (2,224 N)

STATIC LOAD

750 lbs (3,336 N)

TUBE RESTRAINING TORQUE

60 in-lbf (6.7 Nm)

DESIGN

Acme Screw

TEMPERATURE RANGE

-20°F to 120°F (-29°C to 50°C)
(Special grease for low temperature)

ENVIRONMENT

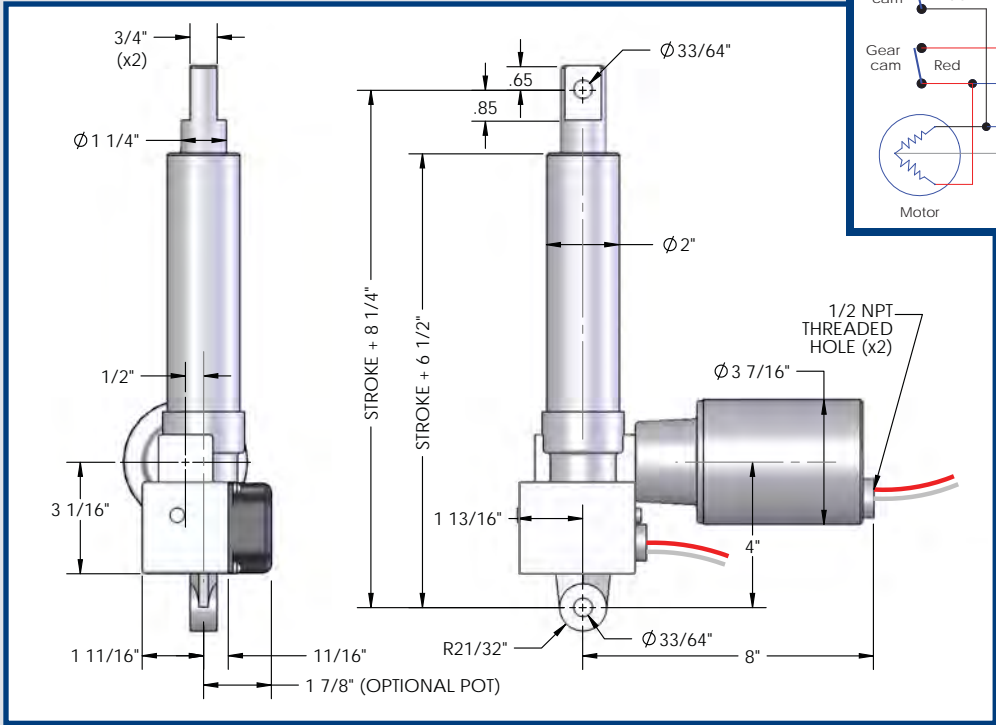
IP50 Protection standard
IP52 Optional

Features & Benefits

- Heavy duty design for long life in tough applications
- Bi-directional Ball Type Brake
- Aluminum housing and outer tube
- Steel translating tube – zinc chromate plated
- Double clevis mounting
- Internal adjustable limit switches
- Automatic reset thermal overload motor protection

Options

- Potentiometer (add “P” prefix)
- Capacitor (see table)
- Weather Resistant Sealant – IP52 (add “W” prefix)
- Bellows Boot
- Threaded End



HMPB Linear Actuator - 500 lb (2,224 N) Capacity

Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load	Limit Switch	Duty Cycle at Rated Load	Potentiometer	Shipping Weight		
	lbs	N	in	mm	in	mm							lbs	kg	
MPB6905-3	500	2,224	3	76	11.25	286	115Vac (60 Hz)	2.3	0.6	15	Yes	19%	No	11	5.0
MPB6905-6			6	152.4	14.25	362								13	5.9
MPB6905-12			12	304.8	20.25	514								16	7.3
MPB6905-18			18	457.2	26.25	667								18	8.2
MPB7905-3	500	2,224	3	76	11.25	286	220 Vac (50 Hz)	1	0.6	15	Yes	22%	No	12	5.4
MPB7905-6			6	152.4	14.25	362								14	6.4
MPB7905-12			12	304.8	20.25	514								17	7.7
MPB7905-18			18	457.2	26.25	667								19	8.6
HMPB6905-3	500	2,224	3	76	11.25	286	115Vac (60 Hz)	5.5	1.33	34	Yes	11%	No	11	5.0
HMPB6905-6			6	152.4	14.25	362								13	5.9
HMPB6905-12			12	304.8	20.25	514								16	7.3
HMPB6905-18			18	457.2	26.25	667								18	8.2
PHMPB6905-3	500	2,224	3	76	11.25	286	115Vac (60 Hz)	5.5	1.33	34	Yes	11%	Yes	12	5.4
PHMPB6905-6			6	152.4	14.25	362								14	6.4
PHMPB6905-12			12	304.8	20.25	514								17	7.7
PHMPB6905-18			18	457.2	26.25	667								19	8.6

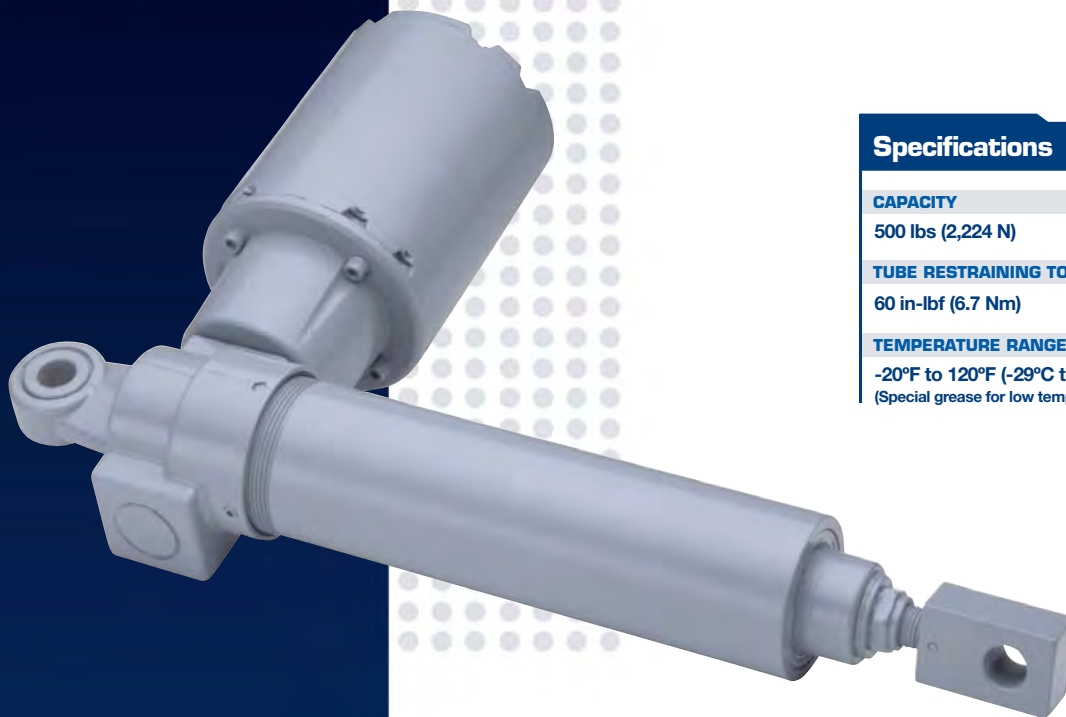
Clutch models are available upon request

Note: A capacitor is required for all AC volt motors. Recommended part SK6405-7-3 (64-72 MFD)

SPB SERIES

500 lbs Clutch

2,224 N Clutch



Specifications

CAPACITY

500 lbs (2,224 N)

STATIC LOAD

750 lbs (3,336 N)

TUBE RESTRAINING TORQUE

60 in-lbf (6.7 Nm)

DESIGN

Acme Screw

TEMPERATURE RANGE

-20°F to 120°F (-29°C to 50°C)
(Special grease for low temperature)

ENVIRONMENT

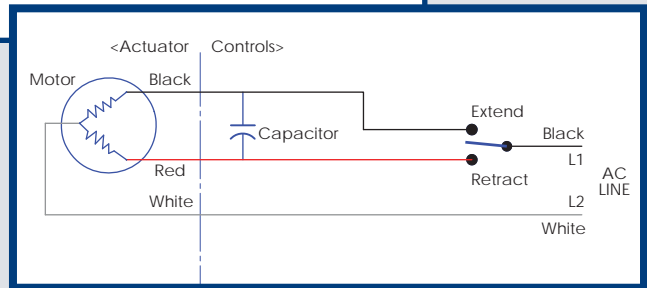
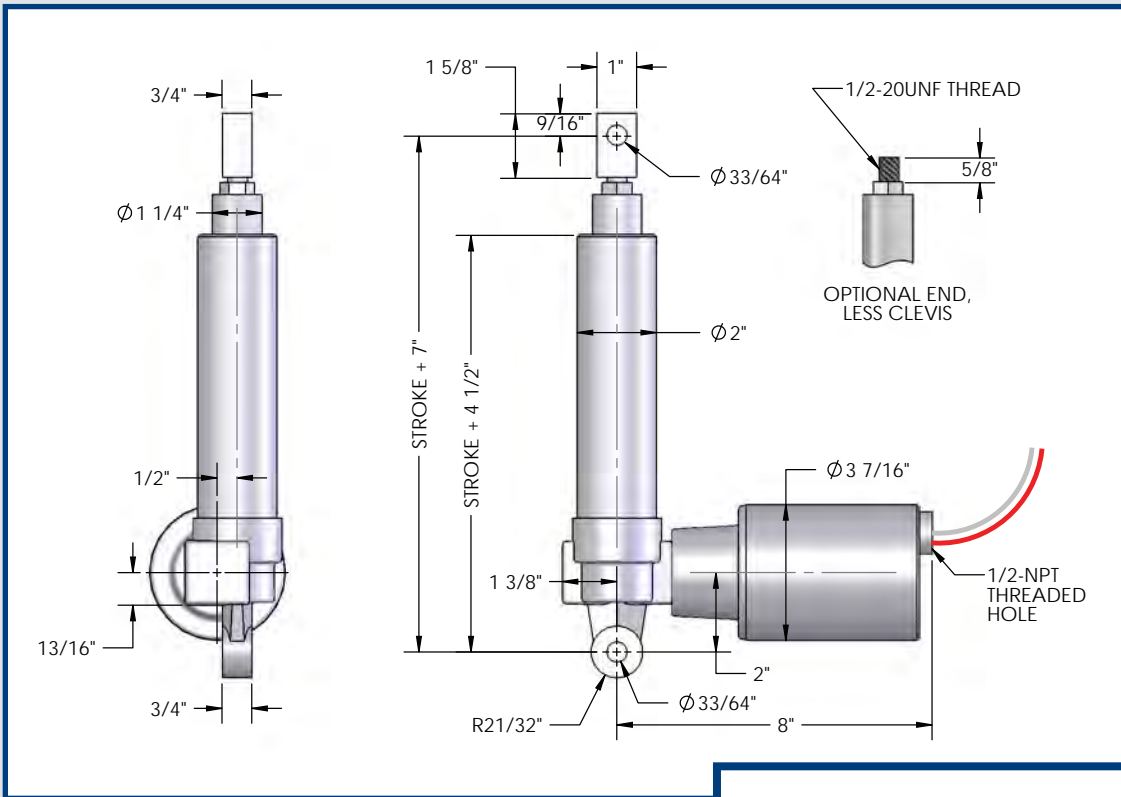
IP50 Protection standard
IP52 Optional

Features & Benefits

- Heavy duty design for long life in tough applications
- Patented Spring Type Brake
- Aluminum housing and outer tube
- Steel translating tube – zinc chromate plated
- Double clevis mounting
- Load limiting friction disc clutch
- Automatic reset thermal overload motor protection

Options

- Capacitor (see table) - Standard on 220 VAC 50 hz model
- Weather Resistant Sealant – IP52 (add “W” prefix)
- Bellows Boot
- Thread end (add “T” prefix)



SPB Series Clutch Model 500 lb (2,224 N) Capacity																
Product Information	Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Clutch	High Speed Motor	Duty Cycle at Rated Load	Shipping Weight	
		lbs	N	in	mm	in	mm			in/s	mm/s				lbs	kg
		SPB6405-3	500	2,224	3	76	10	254	115 Vac (60 Hz)	2.1	0.58	15	Yes	No	23%	10
	SPB6405-6	6			152.4	13	330	12								5.4
	SPB6405-12	12			304.8	19	483	14								6.4
	SPB6405-18	18			457.2	25	635	17								7.7
	SPB7405-3	500	2,224	3	76	10	254	220 Vac (50 Hz)	1	0.51	13	Yes	No	24%	10	4.5
	SPB7405-6			6	152.4	13	330								12	5.4
	SPB7405-12			12	304.8	19	483								14	6.4
	SPB7405-18			18	457.2	25	635								17	7.7
	HSPB6405-3	500	2,224	3	76	10	254	115 Vac (60 Hz)	5.5	1.3	33	Yes	Yes	11%	10	4.5
	HSPB6405-6			6	152.4	13	330								12	5.4
	HSPB6405-12			12	304.8	19	483								14	6.4
	HSPB6405-18			18	457.2	25	635								17	7.7

Note: A capacitor is required for all AC volt motors.

TAC SERIES

500 lbs Clutch

2,224 N Clutch



Specifications

CAPACITY

500 lbs (2,224 N)

STATIC LOAD

1,000 lbs (4,448 N)

TUBE RESTRAINING TORQUE

40 in-lbf (4.5 Nm)

DESIGN

Acme Screw

TEMPERATURE RANGE

-20°F to 120°F (-29°C to 50°C)
(Special grease for low temperature)

ENVIRONMENT

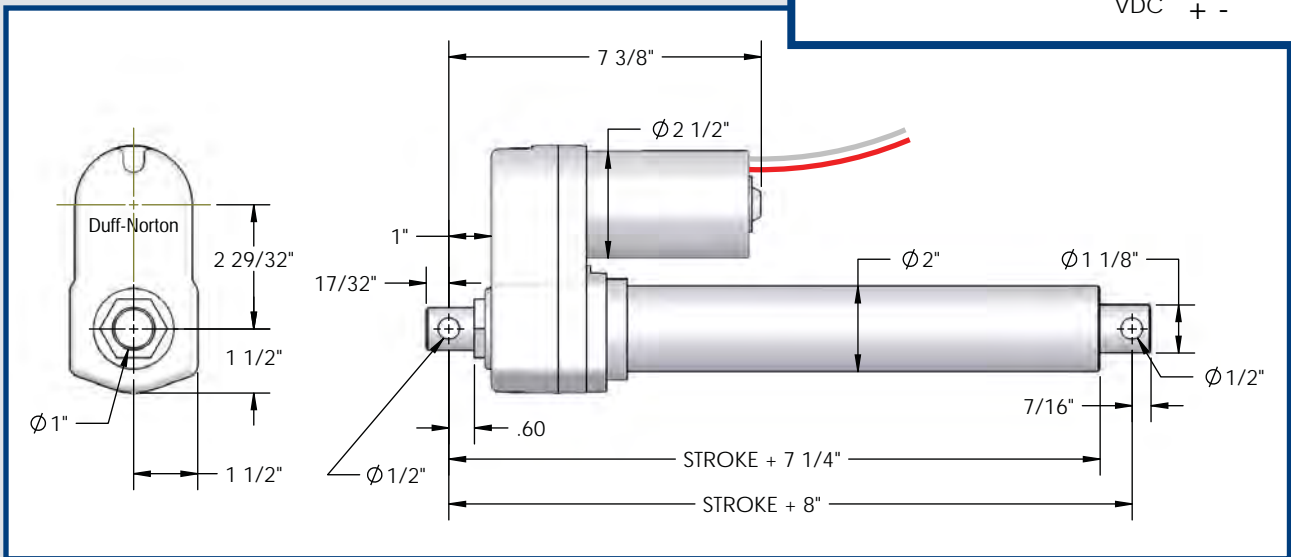
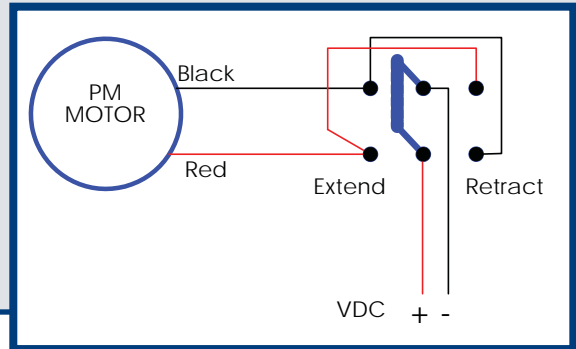
IP50 Protection standard

Features & Benefits

- Heavy duty design for long life in tough applications
- Aluminum housing and outer tube
- Stainless steel translating tube
- Double clevis mounting
- Load limiting ball detent clutch
- Automatic reset thermal overload motor protection

Options

- Bellows boot



TAC Series Clutch Model 500 lb (2,224 N) Capacity																
Product Information	Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Limit Switch	Clutch	Duty Cycle at Rated Load	Shipping Weight	
		lbs	N	in	mm	in	mm			in/s	mm/s				lbs	kg
	TAC05-1D20-4	500	2,224	4	102	12	305	12Vdc	10	0.45	11	No	Yes	40%	15	6.8
	TAC05-1D20-8			8	203	16	406								16	7.3
	TAC05-1D20-12			12	305	20	508								17	7.7
	TAC05-1D20-18			18	407	24	610								18	8.2
	TAC05-2D20-4	500	2,224	4	102	12	305	24Vdc	5	0.45	11	No	Yes	40%	15	6.8
	TAC05-2D20-8			8	203	16	406								16	7.3
	TAC05-2D20-12			12	305	20	508								17	7.7
	TAC05-2D20-18			18	407	24	610								18	8.2

TAL SERIES

1,000 lbs

4,448 N

Specifications

CAPACITY

1,000 lbs (8,896 N)

STATIC LOAD

2,000 lbs (8,896 N)

TUBE RESTRAINING TORQUE

80 in-lbf (9 Nm)

DESIGN

Acme Screw

TEMPERATURE RANGE

-20°F to 120°F (-29°C to 50°C)
(Special grease for low temperature)

ENVIRONMENT

IP50 Protection standard

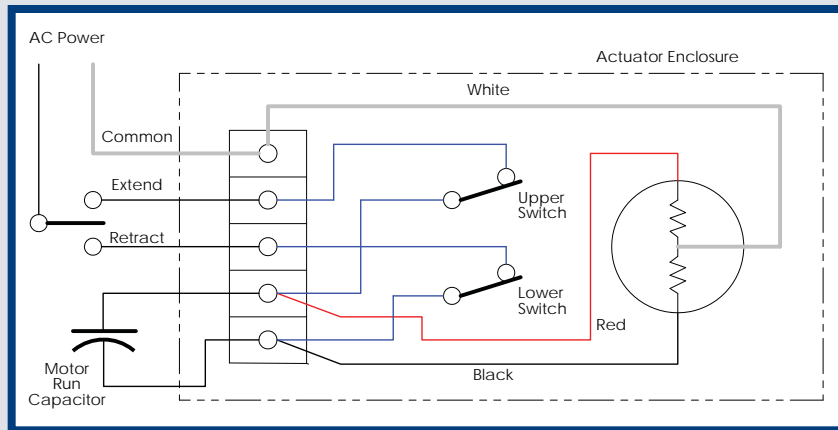
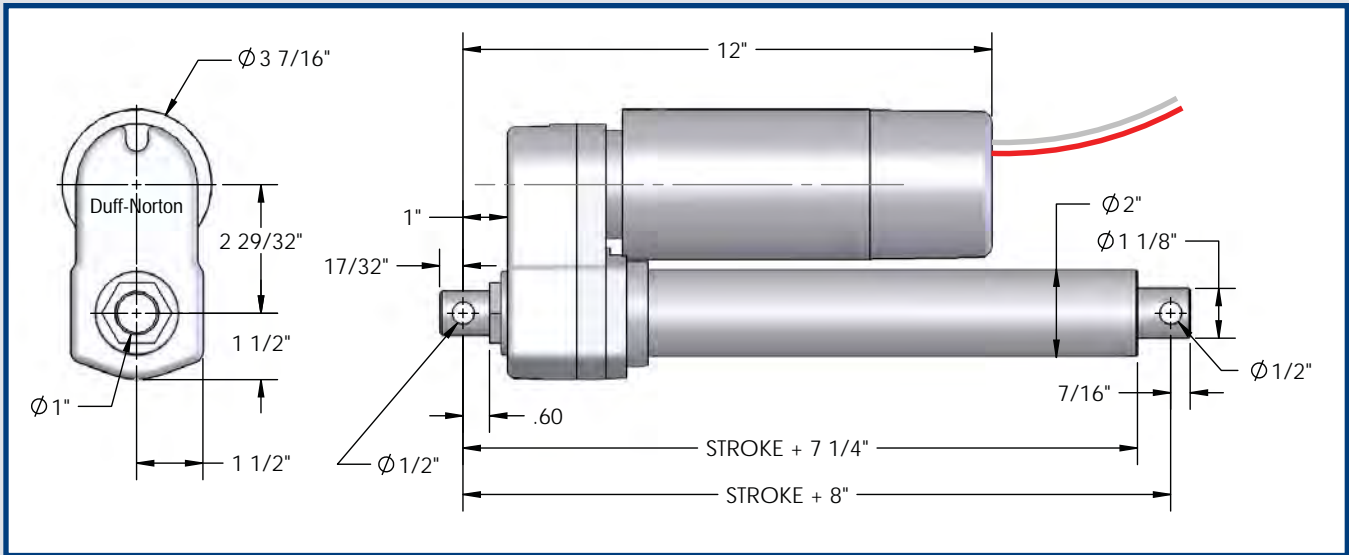


Features & Benefits

- Heavy duty design for long life in tough applications
- Adjustable limit switches on motor end save space
- Aluminum housing and outer tube
- Stainless steel translating tube
- Double clevis mounting
- Automatic reset thermal overload motor protection

Options

- Potentiometer feedback
- Capacitor (see table)
- Bellows Boot



TAL Linear Actuator 1,000 lb (4,448 N) Capacity

Product Information	Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Limit Switch	Duty Cycle at Rated Load	Shipping Weight	
		lbs	N	in	mm	in	mm			in/s	mm/s			lbs	kg
	TAL10-1A20-4	1,000	4,448	4	102	12	305	115 Vac (60 Hz)	4	0.43	10	Yes	17.5%	19	8.6
TAL10-1A20-8	8			203	16	406	21							9.5	
TAL10-1A20-12	12			305	20	508	21							9.5	
TAL10-1A20-18	18			407	24	610	22							10.0	
TAL10-2A20-4	1,000	4,448	4	102	12	305	220 / 230 Vac (50 / 60 Hz)	2.0/2.5	0.45/0.37	11/9	Yes	17% (14%)	19	8.6	
TAL10-2A20-8			8	203	16	406							21	9.5	
TAL10-2A20-12			12	305	20	508							21	9.5	
TAL10-2A20-18			18	407	24	610							22	10.0	

Clutch models are available upon request

Note: A capacitor is required for all AC volt motors.

Recommended part SK6405-7-15 (50 MFD) 115Vac and SK6405-7-14 (15 MFD) 230Vac

LSPD SERIES

1,500 lbs

6,672 N

Specifications

CAPACITY

1,500 lbs (6,672 N)

STATIC LOAD

2,000 lbs (8,896 N)

TUBE RESTRAINING TORQUE

215 in-lbf (24.2 Nm)

DESIGN

Acme Screw

TEMPERATURE RANGE

15°F to 120°F (-10°C to 50°C)

ENVIRONMENT

IP50 Protection standard

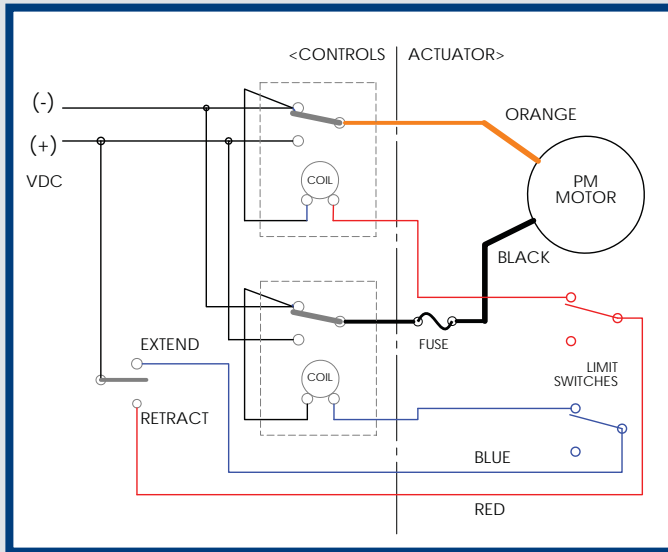
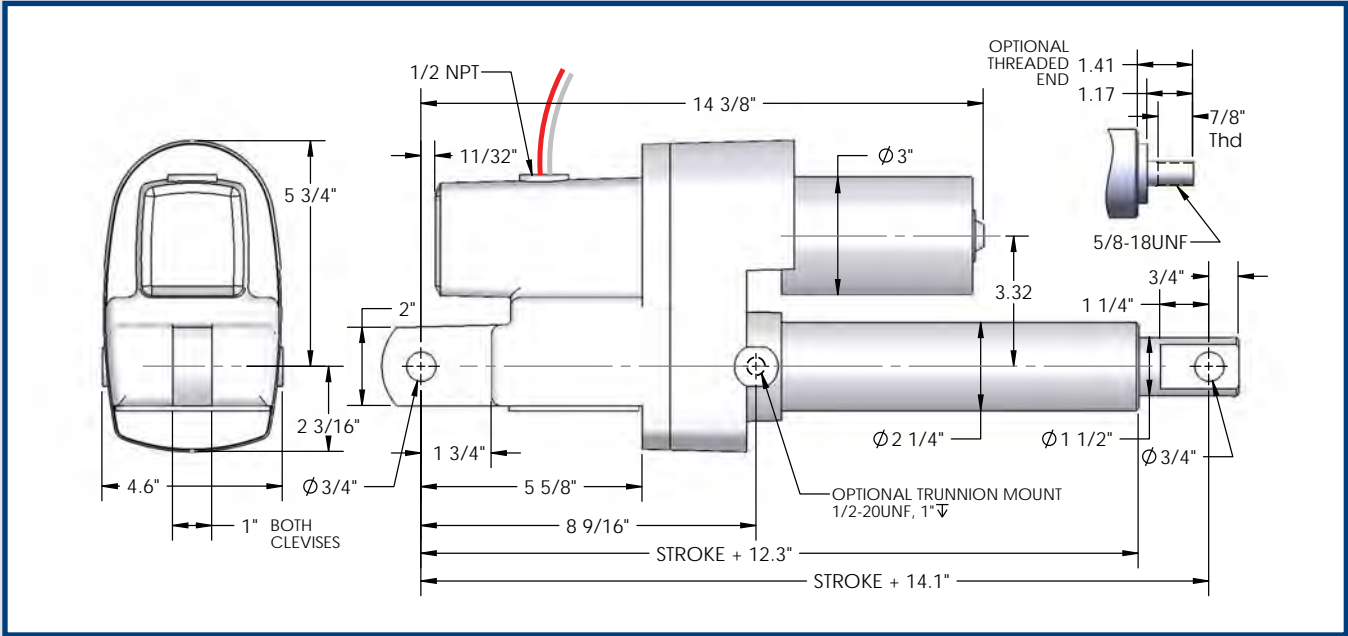


Features & Benefits

- Heavy duty design for long life in tough applications
- Bi-directional spring brake
- Aluminum housing and outer tube
- Steel translating tube – zinc chromate plated
- Double clevis mounting
- Internal adjustable limit switches

Options

- Potentiometer (add “P” prefix)
- Weather Resistant Sealant – IP52 (add “W” prefix)
- Bellows Boot
- Trunnion Mounting (add “R” prefix)
- Thread end (add “T” prefix)



Note:

(2) relays are required for DC limit switch models

LSPD Linear Actuator 1,500 lb (6,672 N) Capacity															
Product Information	Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Limit Switch	Duty Cycle at Rated Load	Shipping Weight	
		lbs	N	in	mm	in	mm			in/s	mm/s			lbs	kg
	LSPD6415-3	1,500	6,672	3	76	17.1	434	12 Vdc	27	0.43	11	Yes	27%	29	13.2
	LSPD6415-6			6	152	20.1	511							31	14.1
	LSPD6415-12			12	305	26.1	663							33	15.0
	LSPD6415-18			18	457	32.1	815							35	15.9
	LSPD6415-24			24	610	38.1	968							37	16.8

Clutch models are available upon request

SPA SERIES

1,500 lbs

6,672 N

Specifications

CAPACITY

1,500 lbs (6,672 N)

STATIC LOAD

2,000 lbs (8,896 N)

TUBE RESTRAINING TORQUE

215 in-lbf (24.2 Nm)

DESIGN

Acme Screw

TEMPERATURE RANGE

15°F to 120°F (-10°C to 50°C)

ENVIRONMENT

IP50 Protection standard

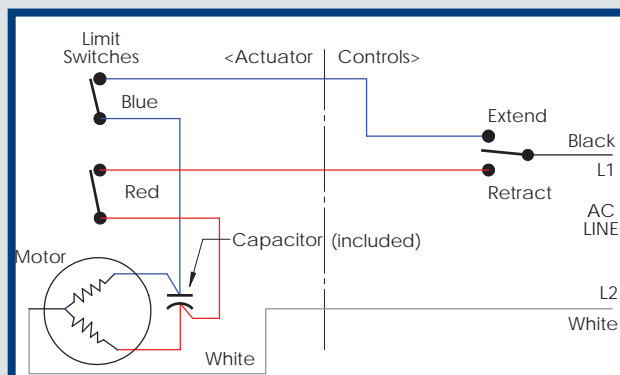
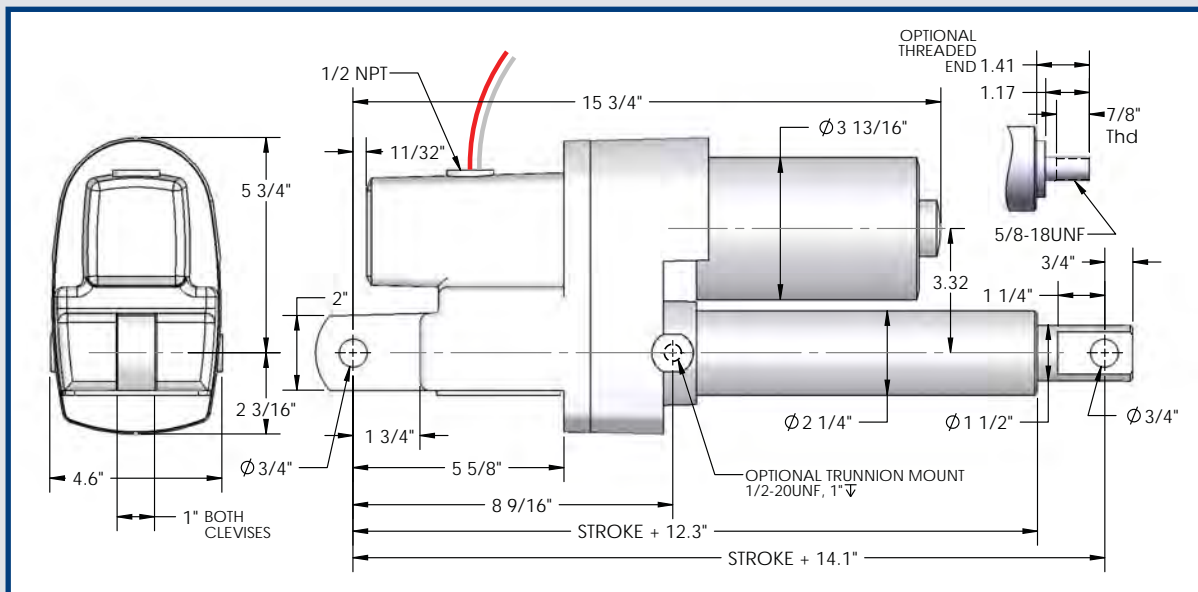


Features & Benefits

- Heavy duty design for long life in tough applications
- Built in capacitor included
- Bi-directional spring brake
- Aluminum housing and outer tube
- Steel translating tube – zinc chromate plated
- Double clevis mounting
- Internal adjustable limit switches
- Automatic reset thermal overload motor protection

Options

- Potentiometer Feedback
- Weather Resistant Sealant – IP52 (add “W” prefix)
- Bellows Boot
- Trunnion Mounting (add “R” prefix)
- Thread end (add “T” prefix)



SPA Series - 1,500 lb (6,672 N) Capacity

Product Information	Part Number	Rated Load		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Limit Switch	Potentiometer	Duty Cycle at Rated Load	Shipping Weight	
		lbs	N	in	mm	in	mm			in/s	mm/s				lbs	kg
	SPA6415-3	1,500	6,672	3	76	17.1	434.3	115 Vac (60 Hz)	6.5	0.83	21	Yes	No	17%	31	14.1
	SPA6415-6			6	152	20.1	510.5								33	15.0
	SPA6415-12			12	305	26.1	662.9								35	15.9
	SPA6415-18			18	457	32.1	815.3								37	16.8
	SPA6415-24			24	610	38.1	967.7								39	17.7
	PSPA6415-3	1,500	6,672	3	76	17.1	434.3	115 Vac (60 Hz)	6.5	0.83	21	Yes	Yes	17%	31	14.1
	PSPA6415-6			6	152	20.1	510.5								33	15.0
	PSPA6415-12			12	305	26.1	662.9								35	15.9
	PSPA6415-18			18	457	32.1	815.3								37	16.8
	PSPA6415-24			24	610	38.1	967.7								39	17.7
	SPA7415-3	1,500	6,672	3	76	17.1	434.3	220 Vac (50 Hz)	2	0.68	17	Yes	No	25%	31	14.1
	SPA7415-6			6	152	20.1	510.5								33	15.0
	SPA7415-12			12	305	26.1	662.9								35	15.9
	SPA7415-18			18	457	32.1	815.3								37	16.8
	SPA7415-24			24	610	38.1	967.7								39	17.7
	PSPA7415-3	1,500	6,672	3	76	17.1	434.3	220 Vac (50 Hz)	2	0.68	17	Yes	Yes	25%	31	14.1
	PSPA7415-6			6	152	20.1	510.5								33	15.0
	PSPA7415-12			12	305	26.1	662.9								35	15.9
	PSPA7415-18			18	457	32.1	815.3								37	16.8
	PSPA7415-24			24	610	38.1	967.7								39	17.7

Note: SPA models are supplied complete with capacitor unless otherwise specified

SPA SERIES

2,000 lbs

8,896 N

Specifications

CAPACITY

2,000 lbs (8,896 N)

STATIC LOAD

2,000 lbs (8,896 N)

TUBE RESTRAINING TORQUE

180 in-lbf (20.3 Nm)

DESIGN

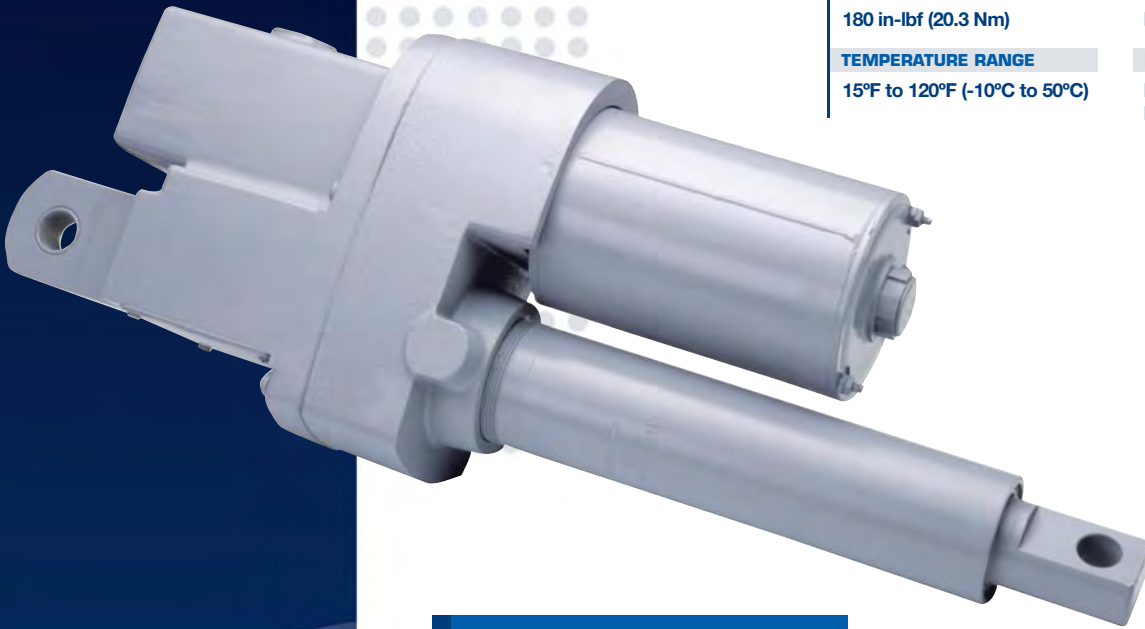
Ball Screw Drive

TEMPERATURE RANGE

15°F to 120°F (-10°C to 50°C)

ENVIRONMENT

IP50 Protection standard
IP52 Optional

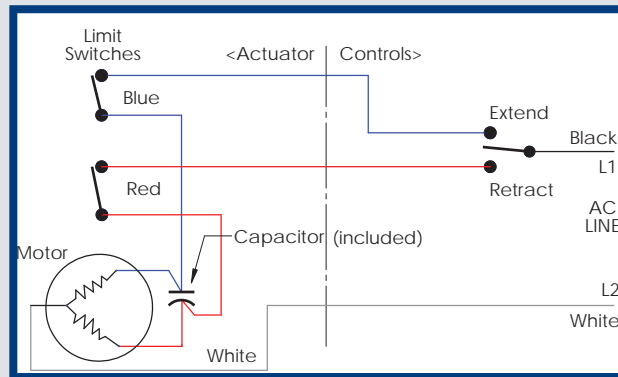
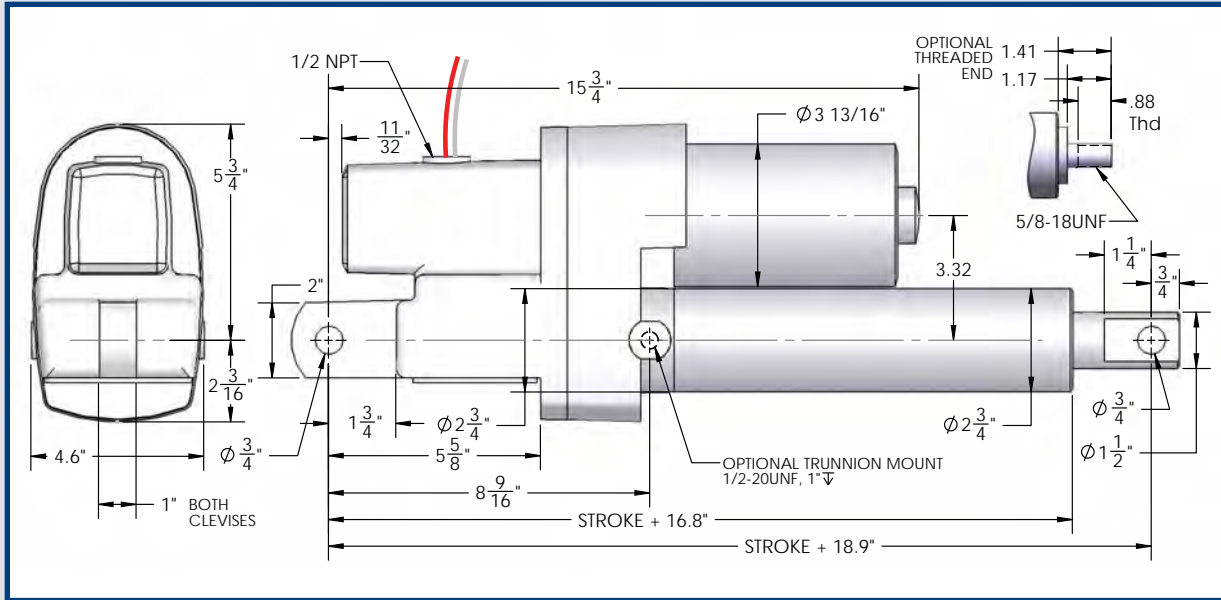


Features & Benefits

- Heavy duty design for long life in tough applications
- Built in capacitor included
- Automatic set spring brake
- Aluminum housing and outer tube
- Steel translating tube – steel zinc chromate plated
- Double clevis mounting
- Internal adjustable limit switches

Options

- Weather Resistant Sealant – IP52 (add “W” prefix)
- Bellows Boot
- Trunnion Mounting (add “R” prefix)
- Potentiometer Feedback
- Thread end (add “T” prefix)



SPA Series 2,000 lb (8,996 N) Capacity

Product Information

Part Number	Rated Load lbs (N)		Stroke Length		Retracted Length		Voltage	Current Draw at Rated Load (A)	Speed at Rated Load		Limit Switch	Duty Cycle at Rated Load	Shipping Weight	
	lbs	N	in	mm	in	mm			in/s	mm/s			lbs	kg
SPA6420-3	2,000	8,996	3	76	21.9	556	115Vac (60 Hz)	5.1	0.86	22	Yes	18%	31	14.1
SPA6420-6			6	152	24.9	632							33	15.0
SPA6420-12			12	305	30.9	785							35	15.9
SPA6420-18			18	457	36.9	937							37	16.8
SPA6420-24			24	610	42.9	1090							39	17.7
PSPA6420-3	2,000	8,996	3	76	21.9	556	115Vac (60 Hz)	5.1	0.86	22	Yes	18%	31	14.1
PSPA6420-6			6	152	24.9	632							33	15.0
PSPA6420-12			12	305	30.9	785							35	15.9
PSPA6420-18			18	457	36.9	937							37	16.8
PSPA6420-24			24	610	42.9	1090							39	17.7
SPA7420-3	2,000	8,996	3	76	21.9	556	220 Vac (50 Hz)	2	0.68	17	Yes	25%	31	14.1
SPA7420-6			6	152	24.9	632							33	15.0
SPA7420-12			12	305	30.9	785							35	15.9
SPA7420-18			18	457	36.9	937							37	16.8
SPA7420-24			24	610	42.9	1090							39	17.7

Contact factory for potentiometer models

Note: SPA models are supplied complete with capacitor unless otherwise specified

MODULAR ACTUATORS

100 to 2,000 lbs

444 to 8,896 N



Duff-Norton Modular Actuators allow use in a wide range of applications by matching standard actuator models with AC or DC electric, air, hydraulic or explosion-proof drive units.

The rotating screw models, featuring a traveling lift nut, permit reliable load positioning in locations which are relatively free of dust, dirt and moisture.

Translating tube units, with an enclosed lifting screw and translating tube, are specified when environmental contamination is anticipated.

Optional limit switches and transducers are also available for both actuator types.

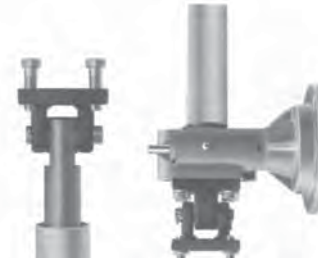
Features & Benefits

- Integral housing flange engineered for NEMA 56 frame motor. C-face mounting. (NEMA 42 and 48 and IEC71 frame motor C-face mounting options available).
- Rated loads to 2,000 lbs., depending on actuator gear ratio and motor horsepower.
- Lift speeds to 170 inches per minute (varied with load and hp/rpm of motor).
- Standard travel up to 24 inches. (consult Duff-Norton engineering for longer travel options).
- Can be tandem-coupled for synchronous operation.
- Optional motors, limit switches and position indicating transducer.
- Clevis attachment accessories available for mounting: eye bracket, clevis bracket and pivot pin.

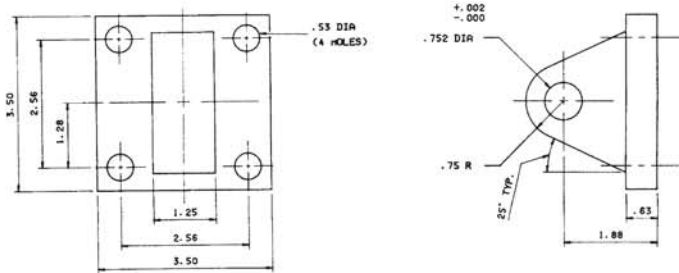
WARNING: These actuators are intended for industrial use only and should not be used to lift, support or otherwise transport people unless you have a written statement from Duff-Norton company which authorizes the specific actuator unit, as used in your application, as suitable for moving people.

Clevis attachments are available for modular actuators. Attachments are suitable for either housing end or translating tube end. Mounting hardware is not included.

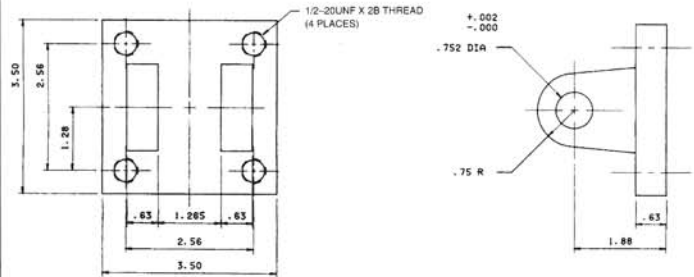
Clevis Accessories



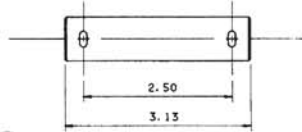
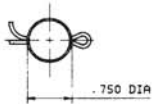
Eye Bracket SK2465-60EB



Clevis Bracket SK2465-61CB



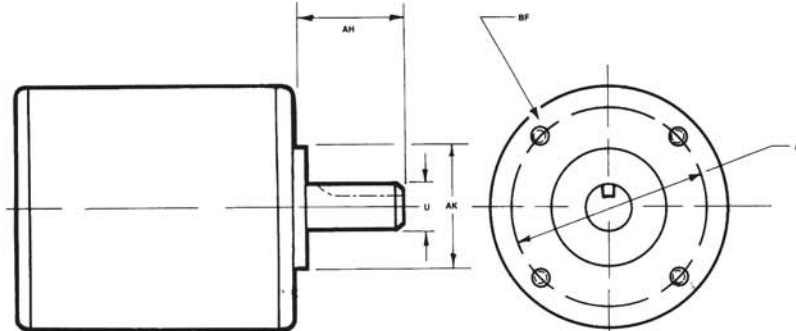
Pivot Pin SK2465-62PP



Pivot Pin Washer H4211C

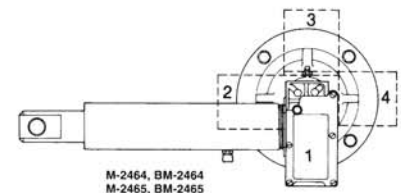
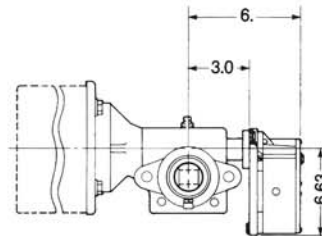
Ordering Information

(For special motor flange)



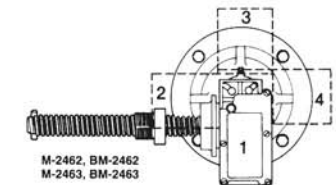
Required Motor Information							
Manufacturer	Type	AH	AK	AJ	U	Key Size	BF

Limit Switch



POSITION	1	2	3	4
M-2462, M-2463, BM-2462, BM-2463	C	A	D	C
M-2464, M-2465, BM-2464, BM-2465	C	X	D	C

- (A) MINIMUM POSITION OF NUT MAY BE AFFECTED.
- (C) ROTARY LIMIT SWITCH EXTENDS BELOW BASE OF ACTUATOR UNIT.
- (D) SEALED ELECTRIC ELBOW WOULD EXTEND BELOW BASE OF ACTUATOR UNIT.
- (X) RECOMMENDED
- (-) NOT RECOMMENDED

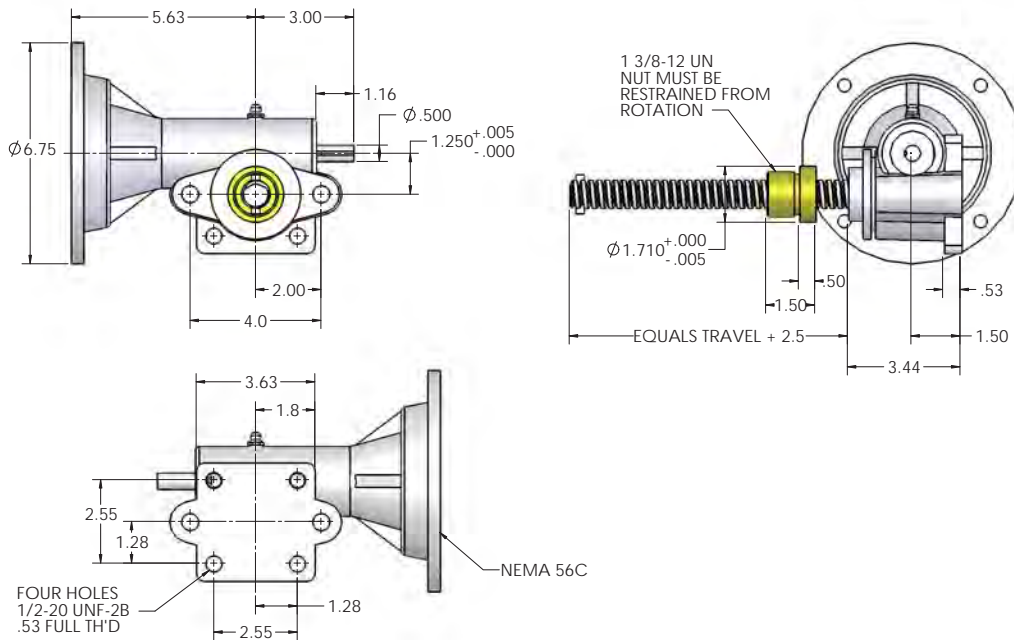


POSITION NO. OF SWITCH

ROTATING MACHINE SCREW MODELS

Features & Benefits

- Integral 56 frame, C-face mounting flange.
- Three-piece flexible coupling for easy motor assembly (included).
- Four threaded holes in base for standard hydraulic cylinder, clevis end accessory attachment. Tapped 1/2 20 UNF-2B.
- Rolled thread lifting screw, with work hardened finish, reduces coefficient of friction between screw and lifting nut. Provides smooth, efficient operation and long service.
- Steel worm and bronze gear set for quiet operation. Available in 5:1 and 20:1 ratios.
- Rugged, lightweight aluminum housing is corrosion resistant.
- Bronze lifting nut for longer life.
- Standard grease fitting on housing for easy lubrication of worm gear.
- Stop-pin at end of lifting screw prevents inadvertent run-off of lifting nut.



Rotating Machine Screw Models

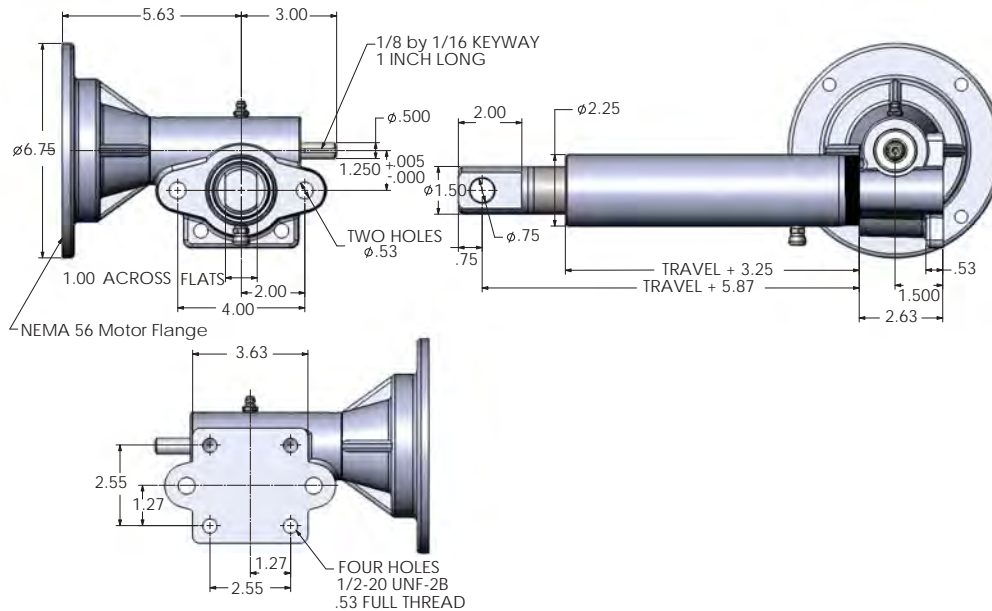
Product Information	Model Number	"T" Screw Dia.	Turns of Worm 1" Travel		Torque lb./in. @ 1000 lb. Loads		Motor RPM	Rated Loads						Lifting Speed in / min	
			Ratio		Ratio			1/3 HP Motor		1/2 HP Motor		3/4 HP Motor		Ratio	
			5:1	20:1	5:1	20:1		5:1	20:1	5:1	20:1	5:1	20:1	5:1	20:1
			lbs	lbs	lbs	lbs		lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
M-2462	.875 Dia. Acme .25 Pitch R.H. Double	10	40	39	18	1725	300	700	500	1000	700	1500	170	43	
							1140	450	1000	700	1500	1100	2000	114	28
M-2463	1.0 Dia. Acme .25 Pitch R.H. Single	20	80	29	14	1725	400	900	600	1400	900	2000	86	21	
							1140	600	1400	900	2000	1400	2000	57	14

- Note: 1. Model M-2462 is self lowering and a motor brake should be used.
 2. Model M-2463 may drift .75 in. (20:1 ratio) to 2.0 in. (5:1 ratio) when motor is shut off. If this is undesirable, a motor brake should be employed.
 3. When ordering other than 56C-face actuators contact applications engineering at 800-477-5002.

TRANSLATING TUBE MACHINE SCREW MODELS

Features & Benefits

- Outer aluminum tube is corrosion-resistant and protects translating tube, lifting screw and nut.
- Wiper-scraper seal in end of outer tube keeps dirt out and lubricants in.
- Bronze guide bushing in the outer tube reduces lateral movement of translating tube.
- Translating tube is zinc coated for weather-resistance.
- Single or double lead lifting screw and nut for high efficiency and longer wear.
- Vented in outer tube to prevent pressure build-up in the actuator
- Furnished with standard clevis end on translating tube. Threaded end is available on special order, depending on application, any type of threaded connection may be substituted.



Translating Tube Machine Screw Models

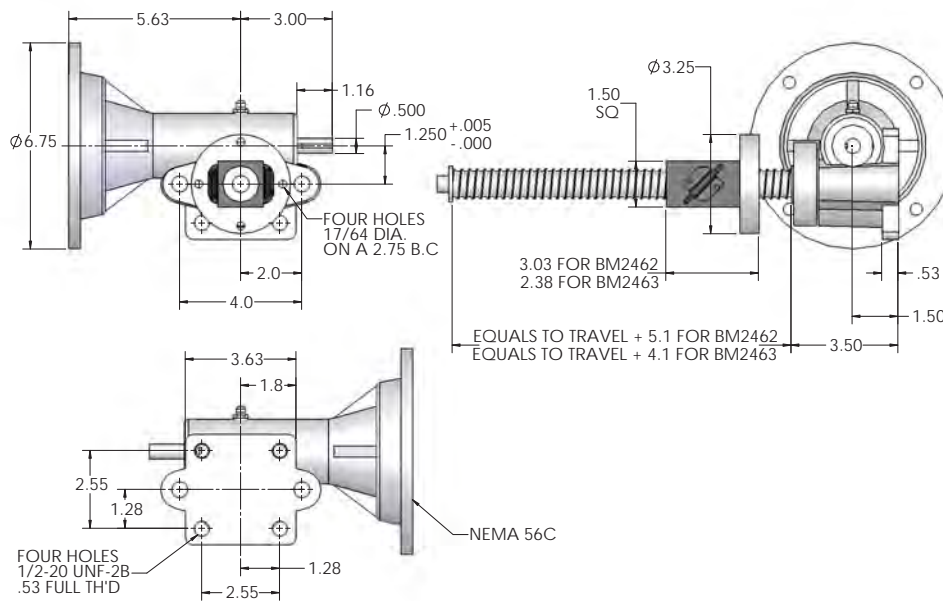
Product Information	Model Number	"T" Screw Dia.	Turns of Worm 1" Travel		Torque lb./in. @ 1000 lb. Loads		Motor RPM	Rated Loads						Lifting Speed in /min	
			Ratio		Ratio			1/3 HP Motor		1/2 HP Motor		3/4 HP Motor		Ratio	
			5:1	20:1	5:1	20:1		5:1	20:1	5:1	20:1	5:1	20:1	5:1	20:1
			lbs	lbs	lbs	lbs		lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
M-2464	.875 Dia. Acme .25 Pitch R.H. Double	10	40	39	18	1725	300	700	500	1000	700	1500	170	43	
							450	1000	700	1500	1100	2000	114	28	
M-2465	1.0 Dia. Acme .25 Pitch R.H. Single	20	80	29	14	1725	400	900	600	1400	900	2000	86	21	
							600	1400	900	2000	1400	2000	57	14	

- Note: 1. Model M-2464 is self lowering and a motor brake should be used.
 2. Model M-2465 may drift .75 in. (20:1 ratio) to 2.0 in. (5:1 ratio) when motor is shut off. If this is undesirable, a motor brake should be employed.
 3. When ordering other than 56C-face actuators contact applications engineering at 800-477-5002.

ROTATING BALL SCREW MODELS

Features & Benefits

- Integral 56 frame, C-face mounting flange.
- Three-piece flexible coupling for easy motor assembly (included).
- Four threaded holes in base for standard clevis end accessory attachment. Tapped 1/2-20 UNF-2B.
- Ball-bearing type screw and mating nut with rolling contact reduces friction to a minimum providing capability for higher speed and longer life with less power requirement.
- Steel worm and bronze gear set for quiet operation. Available in 5:1 and 20:1 ratios.
- Rugged, lightweight aluminum housing is corrosion resistant.
- Standard grease fitting on housing for easy lubrication of worm gear.
- Stop-disc at end of lifting screw prevents inadvertent run-off of ball nut.



Rotating Ball Screw Models

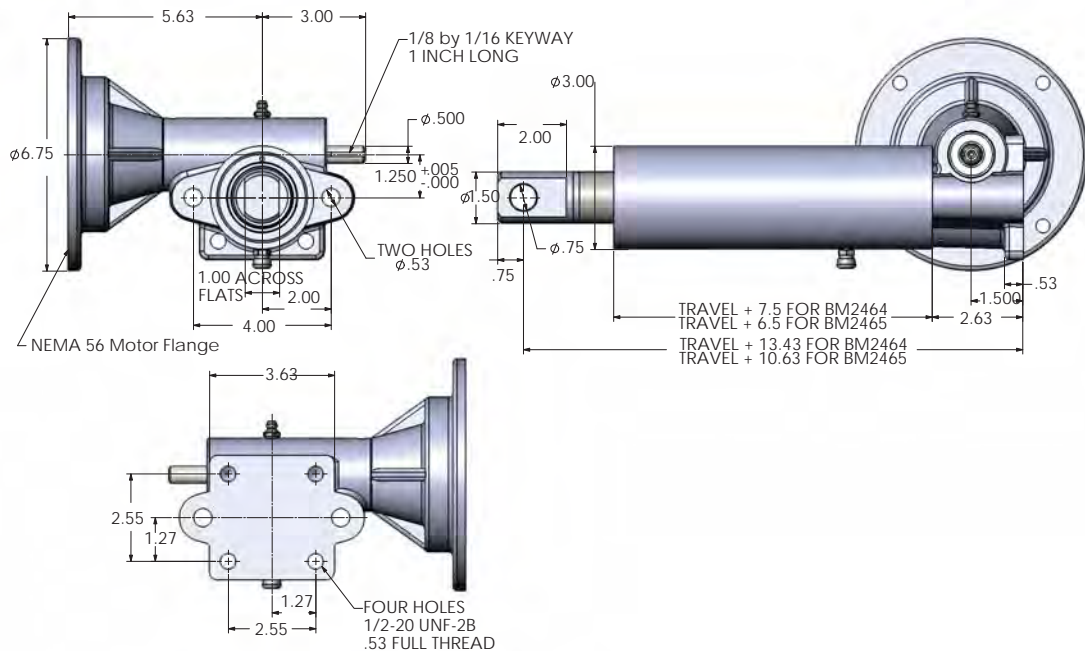
Product Information	Model Number	"T" Screw Dia.	Turns of Worm 1" Travel		Torque lb./in. @ 100 lb. Loads		Motor RPM	Rated Loads								Lifting Speed in./min.	
			Ratio		Ratio			1/4 HP Motor		1/3 HP Motor		1/2 HP Motor		3/4 HP Motor		Ratio	
			5:1	20:1	5:1	20:1		5:1	20:1	5:1	20:1	5:1	20:1	5:1	20:1	5:1	20:1
			lbs.		lbs.			lbs.		lbs.		lbs.		lbs.		lbs.	
			Ratio		Ratio			Ratio		Ratio		Ratio		Ratio		Ratio	
BM-2462	1.00 Dia. x 1.000 Lead Ball Screw	5	-	5.3	-	1725	100	-	200	-	300	-	500	-	345	-	
							1140	200	-	300	-	500	-	700	-	228	-
BM-2463	1.0 Dia. x .250 Lead Ball Screw	20	80	1.3	0.6	1725	600	1500	900	2000	1300	-	2000	-	86	21	
							1140	1000	-	1300	-	2000	-	-	-	57	14

- Note: 1. Model BM-2462 and BM-2463 are self lowering and a motor brake must be used.
 2. Due to high travel speed of BM-2462, it is important that a brake with a minimum response time be used. An independently controlled direct acting brake (6ft.-lb for 3/4 HP motors and 3ft.-lb. for smaller motors) is recommended.
 3. When ordering other than 56C-face actuators contact applications engineering at 800-477-5002.

TRANSLATING TUBE BALL SCREW MODELS

Features & Benefits

- Outer aluminum tube is corrosion-resistant and protects translating tube, lifting screw and nut.
- Wiper-scraper seal in end of outer tube keeps dirt out and lubricants in.
- Bronze guide bushing in the outer tube reduces lateral movement of translating tube.
- Translating tube is zinc coated for weather-resistance.
- Single or quadruple lead ball-bearing type lifting screw and nut for higher efficiency and longer life.
- Vented in outer tube to prevent pressure build-up in the actuator
- Furnished with standard clevis end on translating tube. Threaded end is available on special order, depending on application, any type of threaded connection may be substituted.



Translating Tube Ball Screw Models

Product Information	Model Number	"T" Screw Dia.	Turns of Worm 1" Travel		Torque lb./in. @ 100 lb. Loads		Motor RPM	Rated Loads								Lifting Speed in / min			
			Ratio		Ratio			1/4 HP Motor		1/3 HP Motor		1/2 HP Motor		3/4 HP Motor		Ratio			
			5:1	20:1	5:1	20:1		5:1	20:1	5:1	20:1	5:1	20:1	5:1	20:1	5:1	20:1		
										lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs		
										lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs		
BM-2464	1.00 Dia. x 1.000 Lead Ball Screw	5	-	5.3	-	1725	100	-	200	-	300	-	500	-	345	-			
							1140	200	-	300	-	500	-	700	-	228	-		
BM-2465	1.0 Dia. x .250 Lead Ball Screw	20	80	1.3	0.6	1725	600	1500	900	2000	1300	-	2000	-	86	21			
							1140	1000	-	1300	-	2000	-	-	-	57	14		

- Note: 1. Model BM-2464 and BM-2465 are self lowering and a motor brake must be used.
 2. Due to the high travel speed of BM-2464, it is important that a brake with a minimum response time be used. An independently controlled direct acting brake (6ft.-lb. for 3/4 HP motors and 3ft.-lb. for smaller motors) is recommended.
 3. When ordering other than 56C-face actuators contact applications engineering at 800-477-5002.

ELECTRIC CYLINDERS

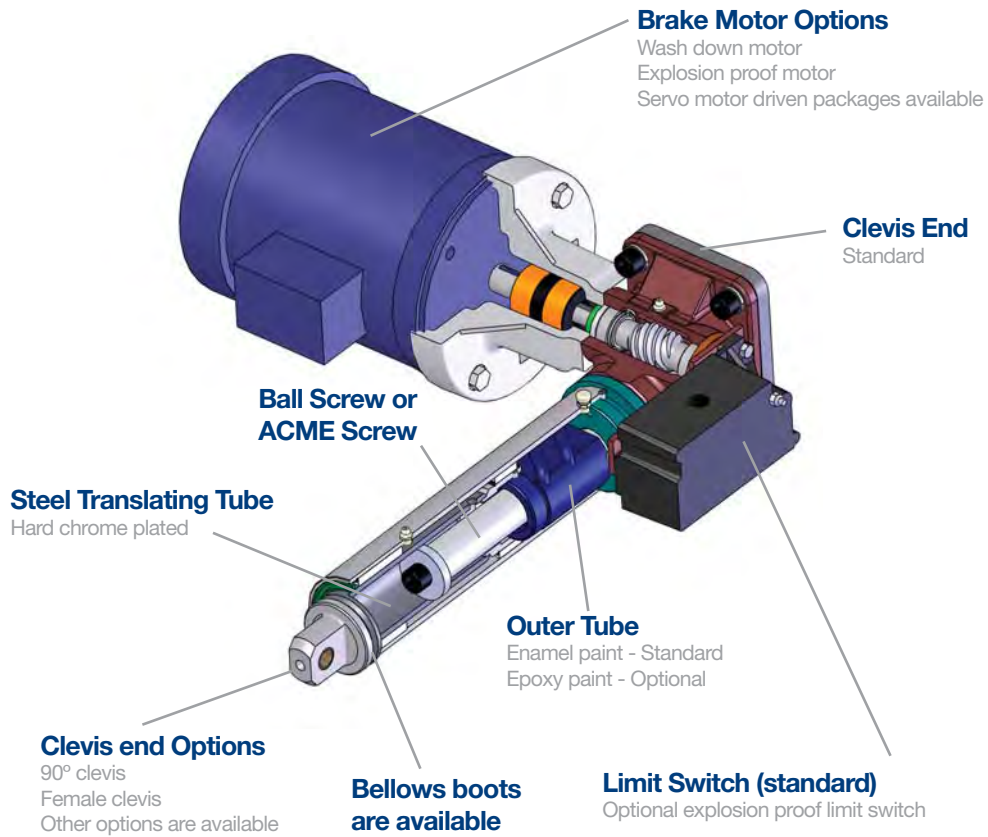
Duff-Norton manufactures the industry's broadest range of high capacity electric cylinders. From 2 to 25 tons (17 to 186 kN), choose from clevis or trunnion mounting; offset, right angle, parallel in-line mounting; standard, with speeds up to 6.3 in/s (160 mm/s).



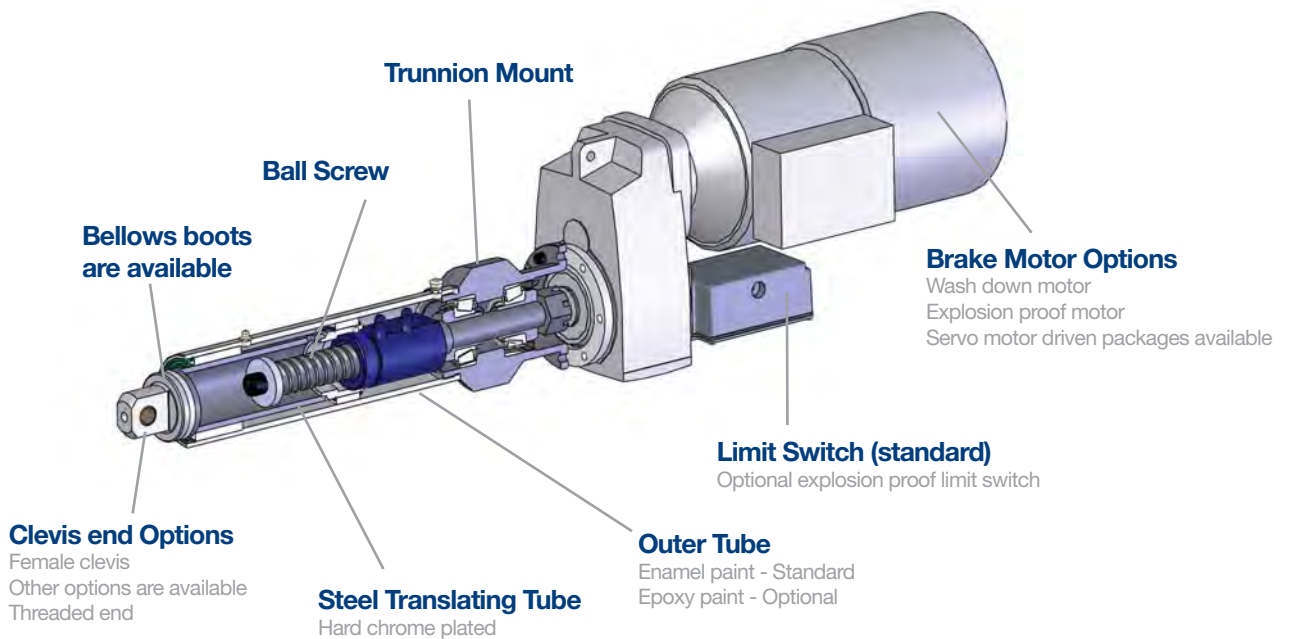
Application Examples

- Slide Gates
- Antennas
- Security barriers
- Dampers
- Ventilation systems
- Pipe conveyors
- Oven doors
- Asphalt testing equipment
- Processing tank doors
- Mine Doors

SCW SUPERCYLINDER



SCN SUPERCYLINDER



SCW02 & SCW03 SERIES

2 & 3 Ton
17 & 26.6 kN



Specifications

CAPACITY

2 to 3 Ton (17 to 26.6 kN)

SPEEDS

Up to 119 in/min (3,022 mm/min)

BRAKE MOTOR

230/460 Vac, 3 ph, 60 Hz

STROKES

Up to 59 in (1,498 mm)

TEMPERATURE RANGE

0°F to 120°F (-18°C to 50°C)*

* For other temperatures please consult the factory

Features & Benefits

- Easy to install - reduces installation costs
- Custom designed for your application
- Low maintenance design - easy to maintain after installation
- Long product life expectancy
- Ball screw or acme screw
- Ductile iron housing
- Chrome plated translating tube
- Adjustable end of stroke limit switches
- Double clevis mounting

Options

- Food grade component options available
- Explosion proof motor and limit switch
- Product designs for outdoor applications
- Manual override
- Other special packages are available upon your application needs

SCW02 & SCW03 Electric Cylinder - 2 & 3 Ton

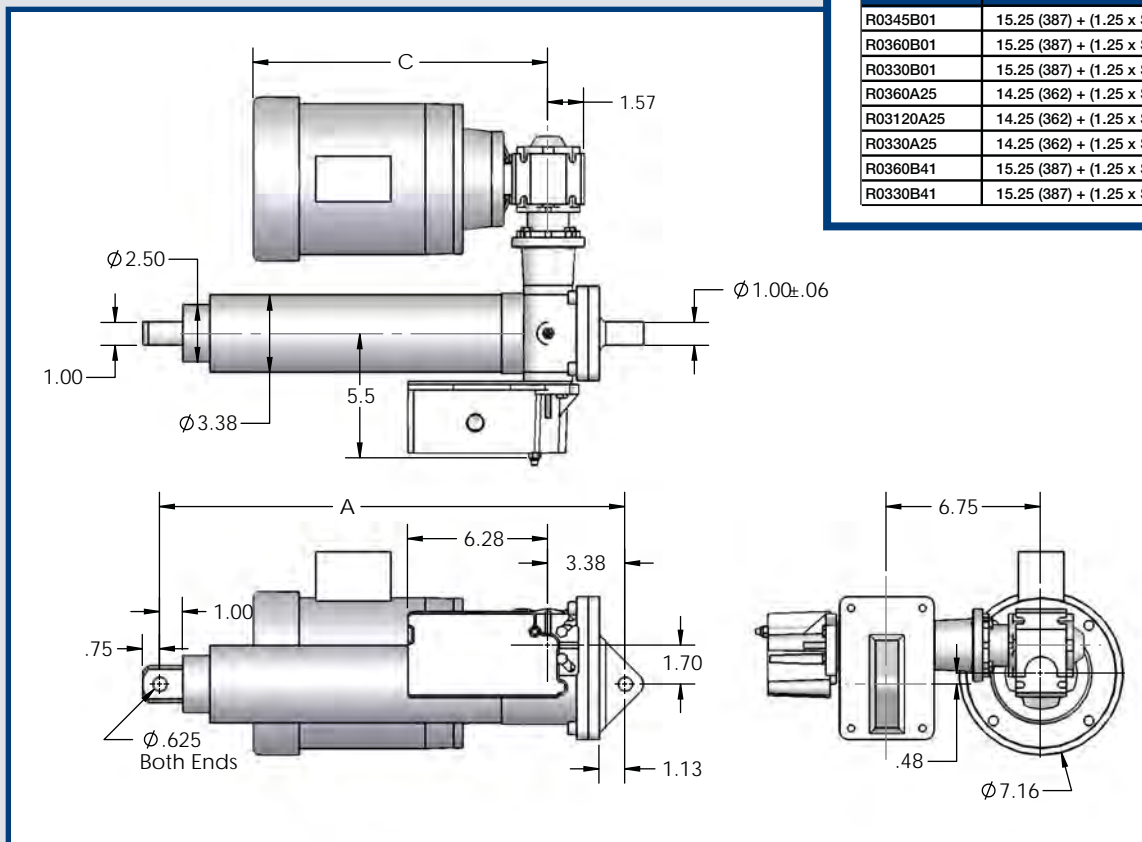
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed at Rated Load		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/s	mm/s	in	mm	HP	kW
SCW02											
W0206A25	2,360	10,497	6, 12, 18, 24, 36	152, 304, 457, 609, 914	14.25 (362) + (1.25 x stroke)	1.2	30	51	1,295	2	1.49
W0206B25	3,280	14,590			15.25 (387) + (1.25 x stroke)	1.2	30	58	1,473	1	0.74
W0224B25	3,500	15,568			15.25 (387) + (1.25 x stroke)	0.3	8	56	1,422	1/2	0.37
W0212B25	4,000	17,792			15.25 (387) + (1.25 x stroke)	0.6	15	52	1,320	3/4	0.55
SCW03											
R0345B01	3,040	13,522	6, 12, 18, 24, 36	152, 304, 457, 609, 914	15.25 (387) + (1.25 x stroke)	0.6	16	58	1,473	1/3	1.37
R0330B01	3,600	16,012			15.25 (387) + (1.25 x stroke)	0.9	24	55	1,473	1	0.74
W0306B41	4,300	19,127			15.25 (387) + (1.25 x stroke)	2.0	50	54	1,371	2	1.49
R0360A25	5,100	22,685			14.25 (362) + (1.25 x stroke)	0.1	3	35	889	1/2	0.37
R03120A25	5,300	23,575			14.25 (362) + (1.25 x stroke)	0.1	2	34	863	1/3	0.24
R0330A25	5,330	23,709			14.25 (362) + (1.25 x stroke)	0.2	6	34	863	1	0.74
R0360B41	5,600	24,910			15.25 (387) + (1.25 x stroke)	0.2	5	47	1,193	1/3	0.24
R0330B41	6,000	26,689			15.25 (387) + (1.25 x stroke)	0.4	10	46	1,168	3/4	0.55

Consult factory for additional speeds and capacities

Stroke lengths are available in 1" increments, please contact factory for details

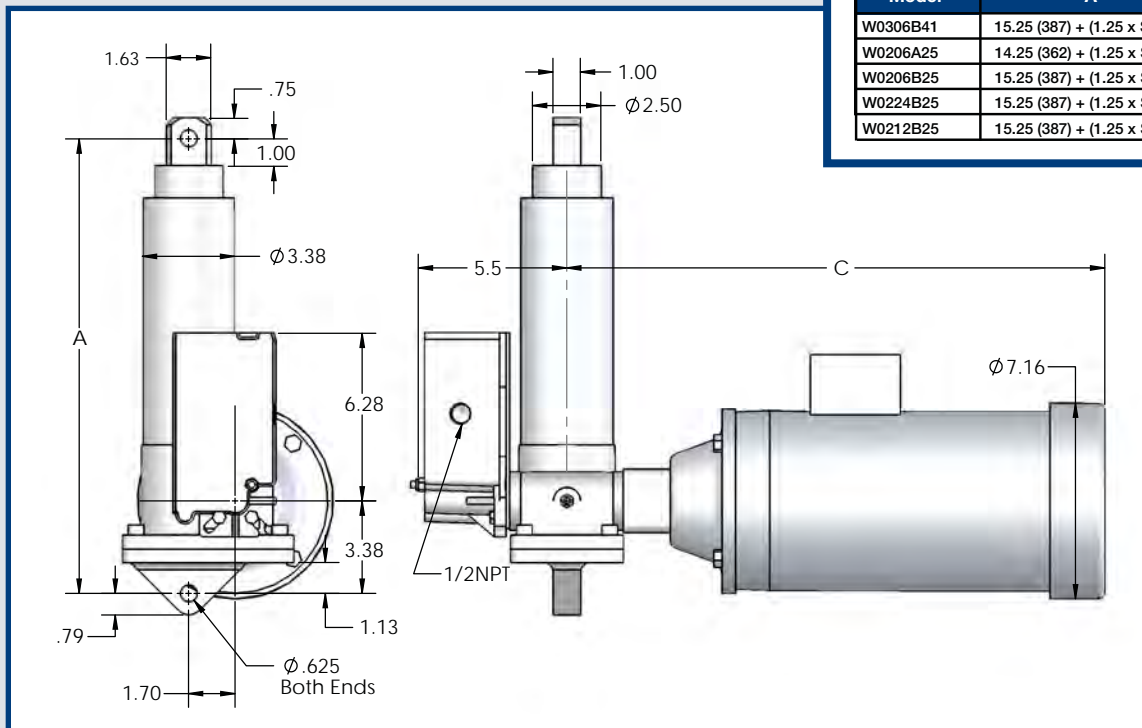
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Parallel Motor



Model	A	C
R0345B01	15.25 (387) + (1.25 x Stroke)	17.14
R0360B01	15.25 (387) + (1.25 x Stroke)	17.14
R0330B01	15.25 (387) + (1.25 x Stroke)	17.64
R0360A25	14.25 (362) + (1.25 x Stroke)	17.14
R03120A25	14.25 (362) + (1.25 x Stroke)	17.64
R0330A25	14.25 (362) + (1.25 x Stroke)	17.64
R0360B41	15.25 (387) + (1.25 x Stroke)	15.64
R0330B41	15.25 (387) + (1.25 x Stroke)	17.14

Right Angle Motor

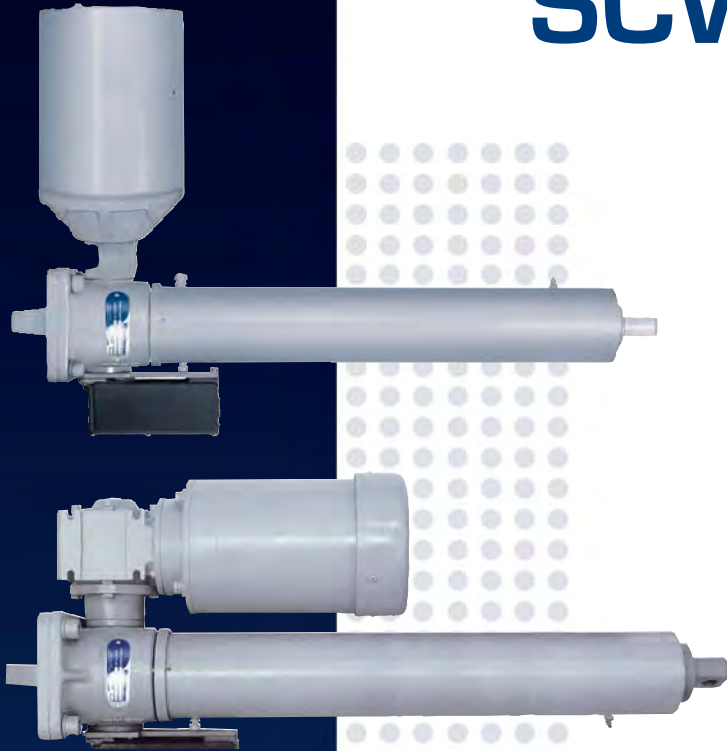


Model	A	C
W0306B41	15.25 (387) + (1.25 x Stroke)	22.1
W0206A25	14.25 (362) + (1.25 x Stroke)	22.1
W0206B25	15.25 (387) + (1.25 x Stroke)	19.7
W0224B25	15.25 (387) + (1.25 x Stroke)	19.2
W0212B25	15.25 (387) + (1.25 x Stroke)	19.2

SCW05 SERIES

5 Ton

44.4 kN



Specifications

CAPACITY

5 Ton (44.4 kN)

SPEEDS

Up to 135.6 in/min (3,444 mm/min)

BRAKE MOTOR

230/460 Vac, 3 ph, 60 Hz

STROKES

Up to 79 in (2,006 mm)

TEMPERATURE RANGE

0°F to 120°F (-18°C to 50°C)*

* For other temperatures please consult the factory

Features & Benefits

- Easy to install - reduces installation costs
- Custom designed for your application
- Low maintenance design - easy to maintain after installation
- Long product life expectancy
- Ball screw or acme screw
- Ductile iron housing
- Chrome plated translating tube
- Adjustable end of stroke limit switches
- Double clevis mounting

Options

- Food grade component options available
- Explosion proof motor and limit switch
- Product designs for outdoor applications
- Manual override
- Other special packages are available upon your application needs

SCW05 Electric Cylinder - 5Ton

Product Information

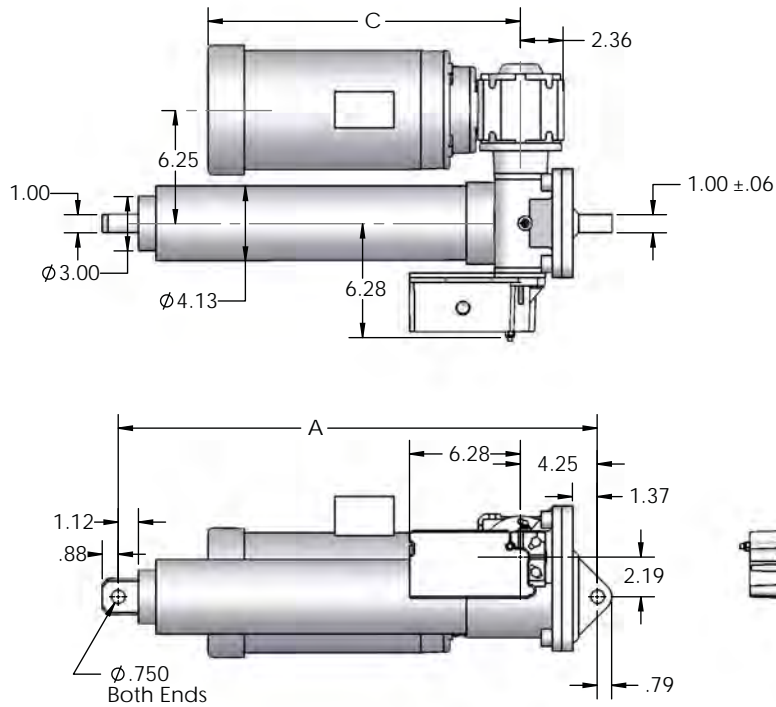
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length in (mm)	Speed at Rated Load		Max Stroke		Motor	
	lbs	N	in	mm		in/s	mm/s	in	mm	HP	kW
W0506B47	5,850	26,022	6, 12, 18, 24, 36	152, 304, 457, 609, 914	19.0 (482) + (1.25 x stroke)	2.3	57	79	2,006	3	2.21
R0530B01	8,000	35,585			19.0 (482) + (1.25 x stroke)	1.0	24	68	1,727	2	1.49
R0560B47	8,900	39,589			19.0 (482) + (1.25 x stroke)	0.2	6	65	1,651	1/2	0.37
R0530B47	9,200	40,923			19.0 (482) + (1.25 x stroke)	0.5	11	64	1,625	1	0.74
R0545B18	9,280	41,279			19.5 (495) + (1.25 x stroke)	1.2	14	62	1,572	3	2.21
R05240B47	10,000	44,482			19.0 (482) + (1.25 x stroke)	0.1	1	61	1,549	1/4	0.18
R05120A37	10,000	44,482			18.0 (457) + (1.25 x stroke)	0.1	2	57	1,447	3/4	0.55
R05120B47	10,000	44,482			18.0 (457) + (1.25 x stroke)	0.1	3	61	1,549	1/3	0.24
R0560A37	10,000	44,482			18.0 (457) + (1.25 x stroke)	0.2	5	57	1,447	1-1/2	1.10
R0545B47	10,000	44,482			19.0 (482) + (1.25 x stroke)	0.3	8	61	1,549	3/4	0.55
R0530A37	10,000	44,482			18.0 (457) + (1.25 x stroke)	0.4	9	57	1,447	3	2.21

Consult factory for additional speeds and capacities

Stroke lengths are available in 1" increments, please contact factory for details

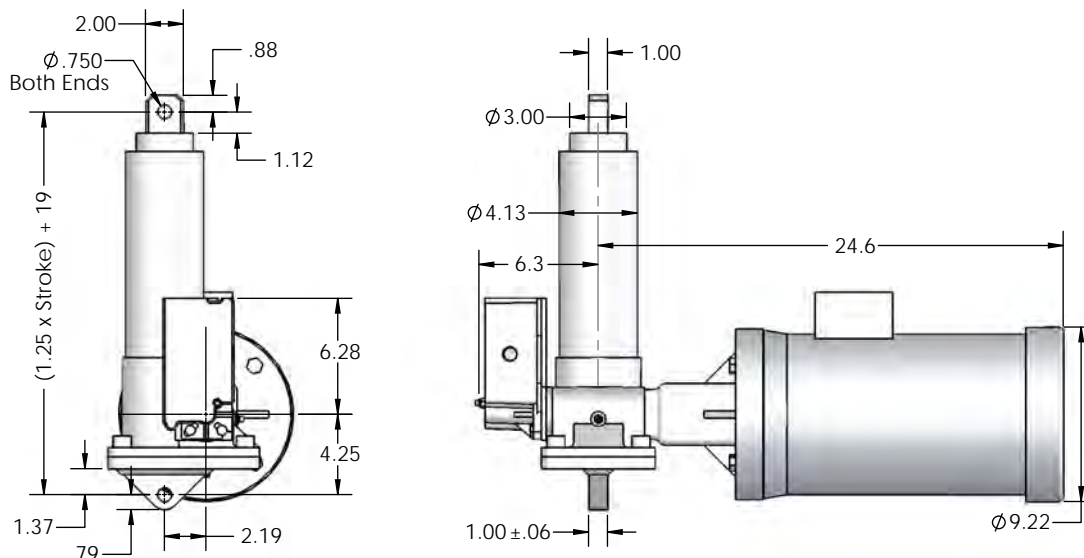
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Parallel Motor



Model	A	C
W0506B47	19.0 (482) + (1.25 x stroke)	21.77
R0530B01	19.0 (482) + (1.25 x stroke)	20.61
R0560B47	19.0 (482) + (1.25 x stroke)	17.26
R0530B47	19.0 (482) + (1.25 x stroke)	17.76
R0545B18	19.5 (495) + (1.25 x stroke)	21.77
R05240B47	19.0 (482) + (1.25 x stroke)	15.76
R05120A37	18.0 (482) + (1.25 x stroke)	17.26
R05120B47	18.0 (457) + (1.25 x stroke)	15.76
R0560A37	18.0 (457) + (1.25 x stroke)	19.61
R0545B47	19.0 (482) + (1.25 x stroke)	17.26
R0530A37	18.0 (457) + (1.25 x stroke)	21.77

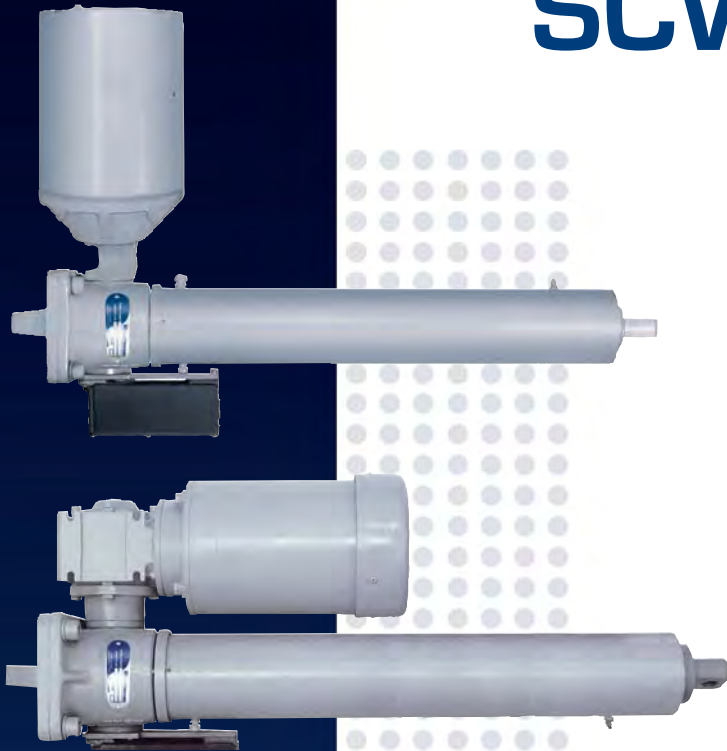
Right Angle Motor



SCW10 SERIES

10 Ton

88.9 kN



Specifications

CAPACITY

10 Ton (89.9 kN)

BRAKE MOTOR

230/460 Vac, 3 ph, 60 Hz

TEMPERATURE RANGE

0°F to 120°F (-18°C to 50°C)*

SPEEDS

Up to 108 in/min (2,743 mm/min)

STROKES

Up to 108 in (2,743 mm)

* For other temperatures please consult the factory

Features & Benefits

- Easy to install - reduces installation costs
- Custom designed for your application
- Low maintenance design - easy to maintain after installation
- Long product life expectancy
- Ball screw or acme screw
- Ductile iron housing
- Chrome plated translating tube
- Adjustable end of stroke limit switches
- Double clevis mounting

Options

- Food grade component options available
- Explosion proof motor and limit switch
- Product designs for outdoor applications
- Manual override
- Other special packages are available upon your application needs

SCW10 Electric Cylinder - 10 Ton

Product Information

Part Number	Rated Load		Standard Stroke Lengths		Retracted Length in (mm)	Speed at Rated Load		Max Stroke		Motor	
	lbs	N	in	mm		in/s	mm/s	in	mm	HP	kW
W1012B50	9,600	42,702	6, 12, 18, 24, 36	152, 304, 457, 609, 914	22.125 (562) + (1.25 x stroke)	1.2	30	108	2,743	3	2.21
W1008B50	11,000	48,930			22.125 (562) + (1.25 x stroke)	1.8	46	108	2,743	5	3.68
R1060B50	15,500	68,947			22.125 (562) + (1.25 x stroke)	0.2	6	108	2,743	1	0.74
R1080A50	17,500	77,843			19.625 (498) + (1.25 x stroke)	0.2	5	73	1,854	2	1.47
R10160B50	18,900	84,071			22.125 (562) + (1.25 x stroke)	0.1	2	108	2,743	1/2	0.37
R10320A50	20,000	88,964			19.625 (498) + (1.25 x stroke)	0.1	1	69	1,752	3/4	0.55
R10160A50	20,000	88,964			19.625 (498) + (1.25 x stroke)	0.1	2	69	1,752	1-1/2	1.10
R1080B50	20,000	88,964			22.125 (562) + (1.25 x stroke)	0.2	5	108	2,743	1	0.74
R1040B50	20,000	88,964			22.125 (562) + (1.25 x stroke)	0.4	9	108	2,743	2	1.47
R1040A50	20,000	88,964			19.625 (498) + (1.25 x stroke)	0.4	9	69	1,752	5	3.68

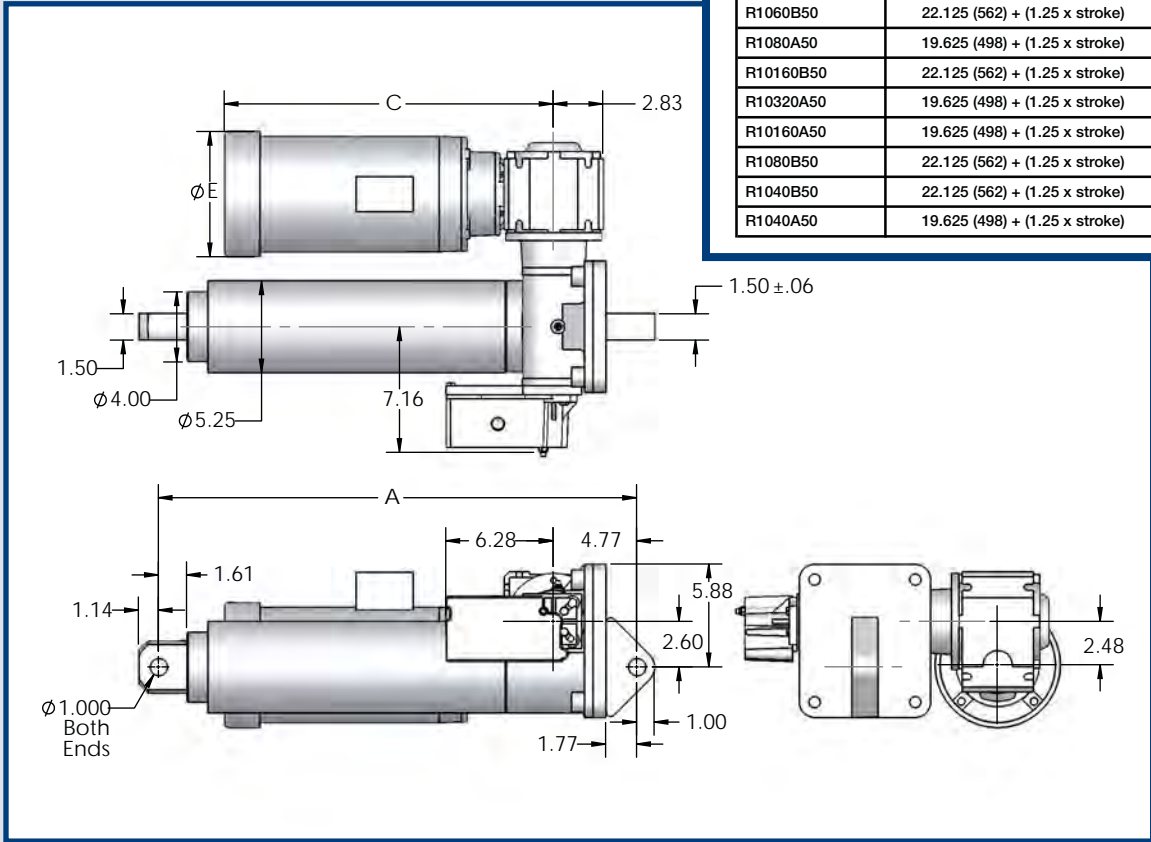
Consult factory for additional speeds and capacities

Stroke lengths are available in 1" increments, please contact factory for details

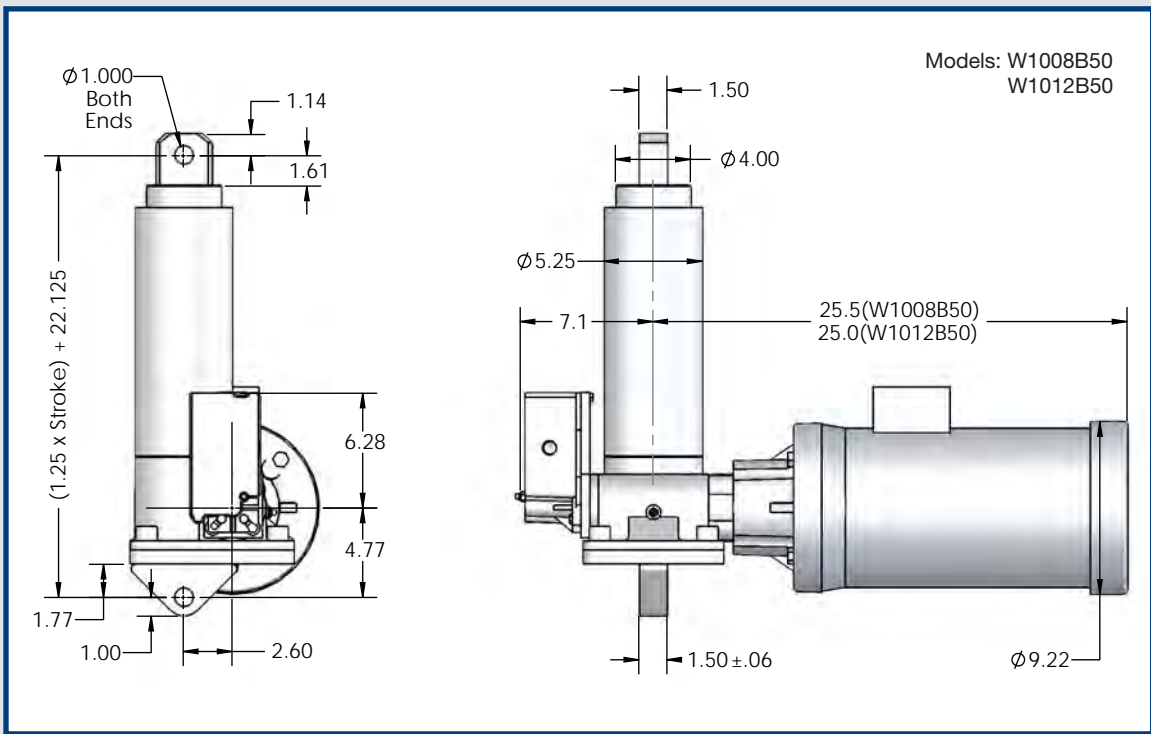
www.duffnorton.com • Ph: (800) 477-5002 • Fax: (704) 588-1994 • SCW10.pdf

Parallel Motor

Model	A	C	E
W1012B50	22.125 (562) + (1.25 x stroke)	21.20	7.16
W1008B50	22.125 (562) + (1.25 x stroke)	23.01	9.22
R1060B50	22.125 (562) + (1.25 x stroke)	18.35	7.16
R1080A50	19.625 (498) + (1.25 x stroke)	21.20	7.16
R10160B50	22.125 (562) + (1.25 x stroke)	17.85	7.16
R10320A50	19.625 (498) + (1.25 x stroke)	17.85	7.16
R10160A50	19.625 (498) + (1.25 x stroke)	20.20	7.16
R1080B50	22.125 (562) + (1.25 x stroke)	18.35	7.16
R1040B50	22.125 (562) + (1.25 x stroke)	21.20	7.16
R1040A50	19.625 (498) + (1.25 x stroke)	23.01	9.22



Right Angle Motor



SCW20 SERIES

20 Ton

177.9 kN



Specifications

CAPACITY

20 Ton (177.9 kN)

BRAKE MOTOR

230/460 Vac, 3 ph, 60 Hz

TEMPERATURE RANGE

0°F to 120°F (-18°C to 50°C)*

SPEEDS

Up to 21.6 in/min (2,743 mm/min)

STROKES

Up to 132 in (3,352 mm)

* For other temperatures please consult the factory

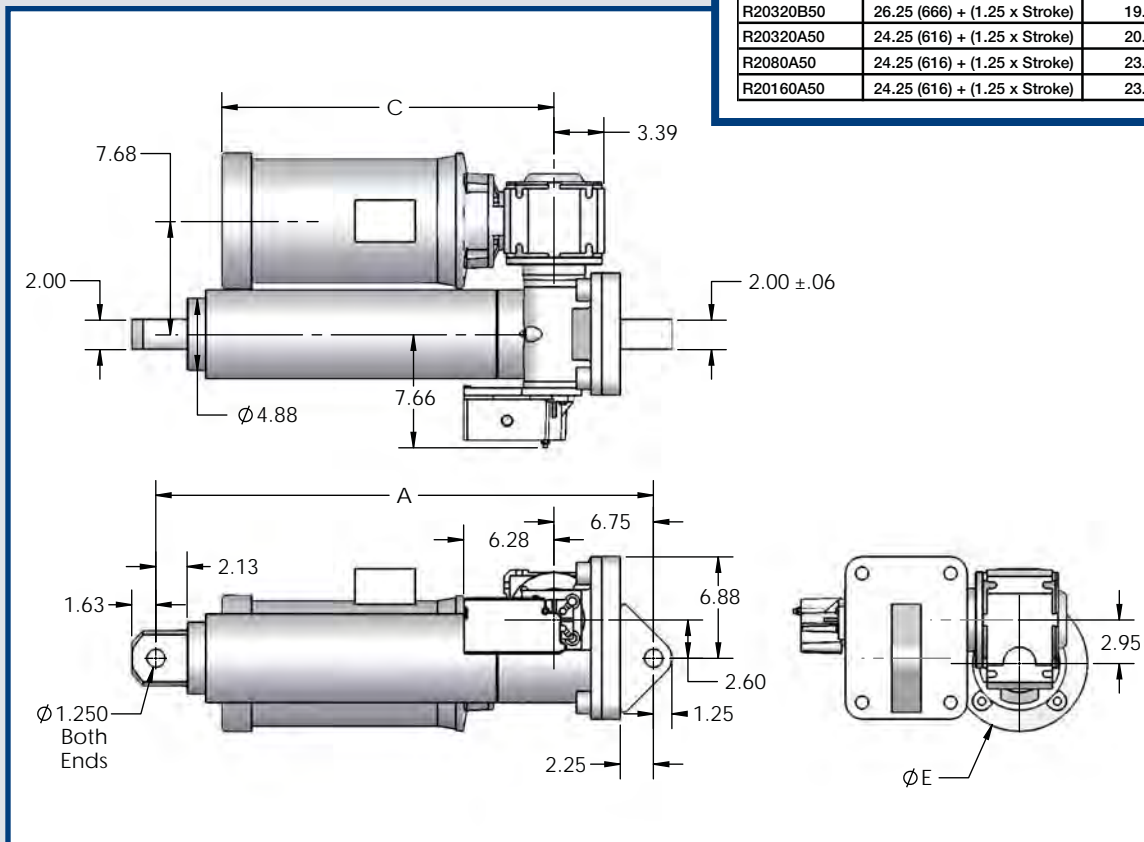
Features & Benefits

- Easy to install - reduces installation costs
- Custom designed for your application
- Low maintenance design - easy to maintain after installation
- Long product life expectancy
- Ball screw or acme screw
- Ductile iron housing
- Chrome plated translating tube
- Adjustable end of stroke limit switches
- Double clevis mounting

Options

- Food grade component options available
- Explosion proof motor and limit switch
- Product designs for outdoor applications
- Manual override
- Other special packages are available upon your application needs

Model	A	C	E
R20160B50	26.25 (666) + (1.25 x Stroke)	19.09	7.16
R2080B50	26.25 (666) + (1.25 x Stroke)	20.97	7.16
R2060B50	26.25 (666) + (1.25 x Stroke)	21.97	7.16
R2040B50	26.25 (666) + (1.25 x Stroke)	23.07	9.22
R20320B50	26.25 (666) + (1.25 x Stroke)	19.09	7.16
R20320A50	24.25 (616) + (1.25 x Stroke)	20.97	7.16
R2080A50	24.25 (616) + (1.25 x Stroke)	23.52	9.22
R20160A50	24.25 (616) + (1.25 x Stroke)	23.07	9.22



SCW20 Electric Cylinder

Product Information	Part Number	Rated Load		Standard Stroke Lengths		Retracted Length		Speed at Rated Load		Max Stroke		Motor	
		lbs	N	in	mm	in (mm)	in/s	mm/s	in	mm	HP	kW	
	R20160B50	26,800	119,212	6, 12, 18, 24, 36	152, 304, 457, 609, 914	26.25 (666) + (1.25 x stroke)	0.1	2	132	3,352	3/4	0.55	
R2080B50	29,300	130,332	26.25 (666) + (1.25 x stroke)			0.2	5	132	3,352	1-1/2	1.10		
R2060B50	29,700	132,112	26.25 (666) + (1.25 x stroke)			0.2	6	132	3,352	2	1.49		
R2040B50	30,700	136,560	26.25 (666) + (1.25 x stroke)			0.4	9	132	3,352	3	2.21		
R20320B50	30,900	137,450	26.25 (666) + (1.25 x stroke)			0.1	1	132	3,352	1/2	0.37		
R20320A50	32,000	142,343	24.25 (616) + (1.25 x stroke)			0.1	1	99	2,514	1-1/2	1.10		
R2080A50	32,000	142,343	24.25 (616) + (1.25 x stroke)			0.2	5	99	2,514	5	3.68		
R20160A50	35,000	155,687	24.25 (616) + (1.25 x stroke)			0.1	2	95	2,413	3	2.21		

Consult factory for additional speeds and capacities
 Stroke lengths are available in 1" increments, please contact factory for details

SCW25 SERIES

25 Ton

222 kN



Specifications

CAPACITY

25 Ton (222 kN)

BRAKE MOTOR

230/460 Vac, 3 ph, 60 Hz

TEMPERATURE RANGE

0°F to 120°F (-18°C to 50°C)*

SPEEDS

Up to 19.58 in/min (502 mm/min)

STROKES

Up to 140 in (3,581 mm)

* For other temperatures please consult the factory

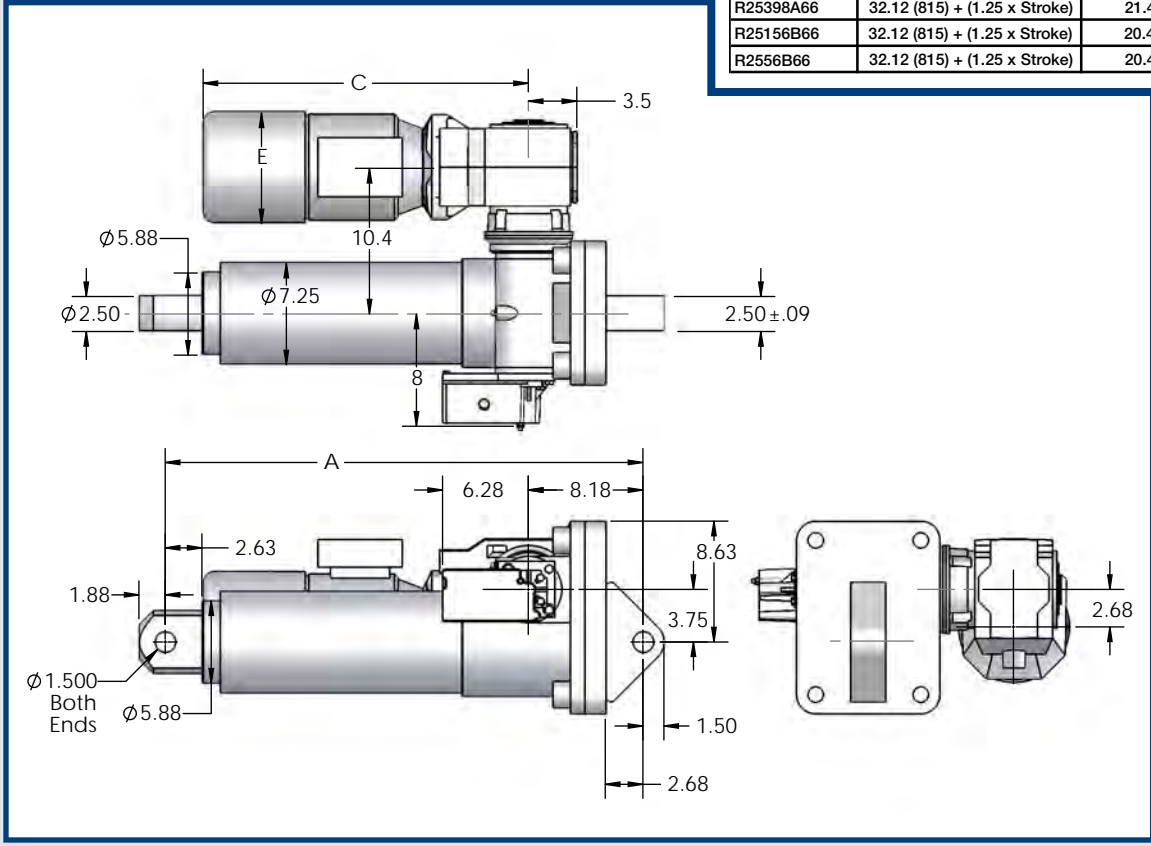
Features & Benefits

- Easy to install - reduces installation costs
- Custom designed for your application
- Low maintenance design - easy to maintain after installation
- Long product life expectancy
- Ball screw or acme screw
- Ductile iron housing
- Chrome plated translating tube
- Adjustable end of stroke limit switches
- Double clevis mounting

Options

- Food grade component options available
- Explosion proof motor and limit switch
- Product designs for outdoor applications
- Manual override
- Other special packages are available upon your application needs

Model	A	C	E
R25150A66	29.12 (739) + (1.25 x Stroke)	23.23	7.91
R2578B66	32.12 (815) + (1.25 x Stroke)	22.24	7.91
R25104A66	29.12 (739) + (1.25 x Stroke)	28.51	10.47
R25115B66	32.12 (815) + (1.25 x Stroke)	20.43	7.20
R25334B66	32.12 (815) + (1.25 x Stroke)	17.83	6.50
R25398A66	32.12 (815) + (1.25 x Stroke)	21.42	7.20
R25156B66	32.12 (815) + (1.25 x Stroke)	20.43	7.20
R2556B66	32.12 (815) + (1.25 x Stroke)	20.43	7.91

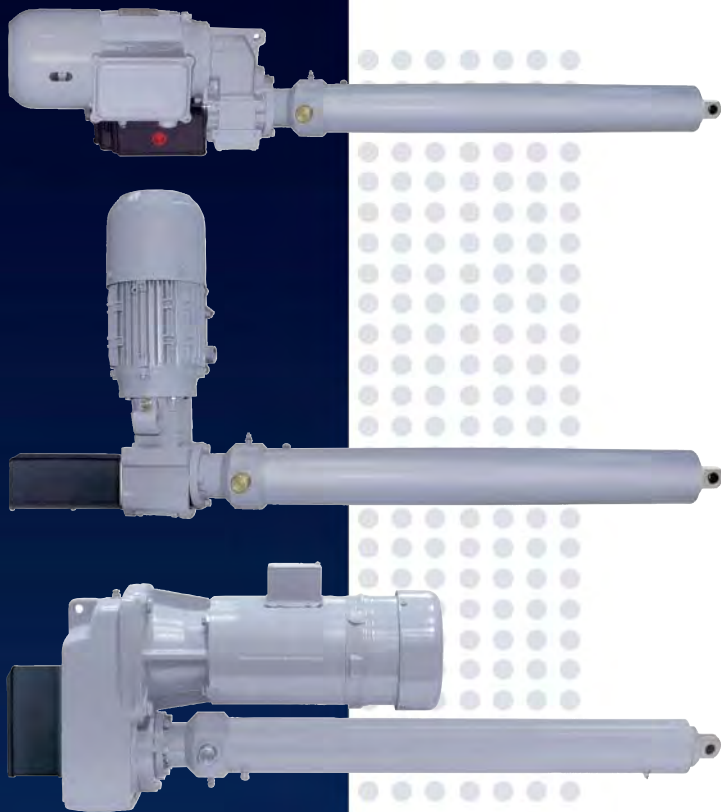


SCW25 Electric Cylinder												
Product Information	Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed at Rated Load		Max Stroke in (mm)		Motor	
		lbs	N	in	mm	in (mm)	in/s	mm/s	in	mm	HP	kW
	R25150A66	47,400	210,845	6, 12, 18, 24, 36	152, 304, 457, 609, 914	29.12 (739) + (1.25 x stroke)	0.1	3	141	3,581	5	3.68
	R2578B66	49,300	219,297			32.12 (815) + (1.25 x stroke)	0.2	6	131	3,327	3	2.21
	R25104A66	49,500	220,186			29.12 (739) + (1.25 x stroke)	0.2	5	138	3,505	7-1/2	5.52
	R25115B66	49,900	221,966			32.12 (815) + (1.25 x stroke)	0.2	4	130	3,302	2	1.49
	R25334B66	50,000	222,411			32.12 (815) + (1.25 x stroke)	0.1	1	130	3,302	2	1.49
	R25398A66	50,000	222,411			32.12 (815) + (1.25 x stroke)	0.1	1	138	3,505	2	1.49
	R25156B66	50,000	222,411			32.12 (815) + (1.25 x stroke)	0.1	3	130	3,302	5	3.68
	R2556B66	50,000	222,411			32.12 (815) + (1.25 x stroke)	0.3	8	130	3,302	5	3.68

Consult factory for additional speeds and capacities
 Stroke lengths are available in 1" increments, please contact factory for details

SCN03 SERIES

3 Ton
26.6 kN



Specifications

CAPACITY

3 Ton (26.6 kN)

BRAKE MOTOR

TEFC 230/460 Vac, 3 ph, 60 Hz

TEMPERATURE RANGE

0°F to 120°F (-18°C to 50°C)*

SPEEDS

Up to 182.4 in/min (4,633 mm/m)

STROKES

Up to 61 in (1,549 mm)

* For other temperatures
please consult the factory

Features & Benefits

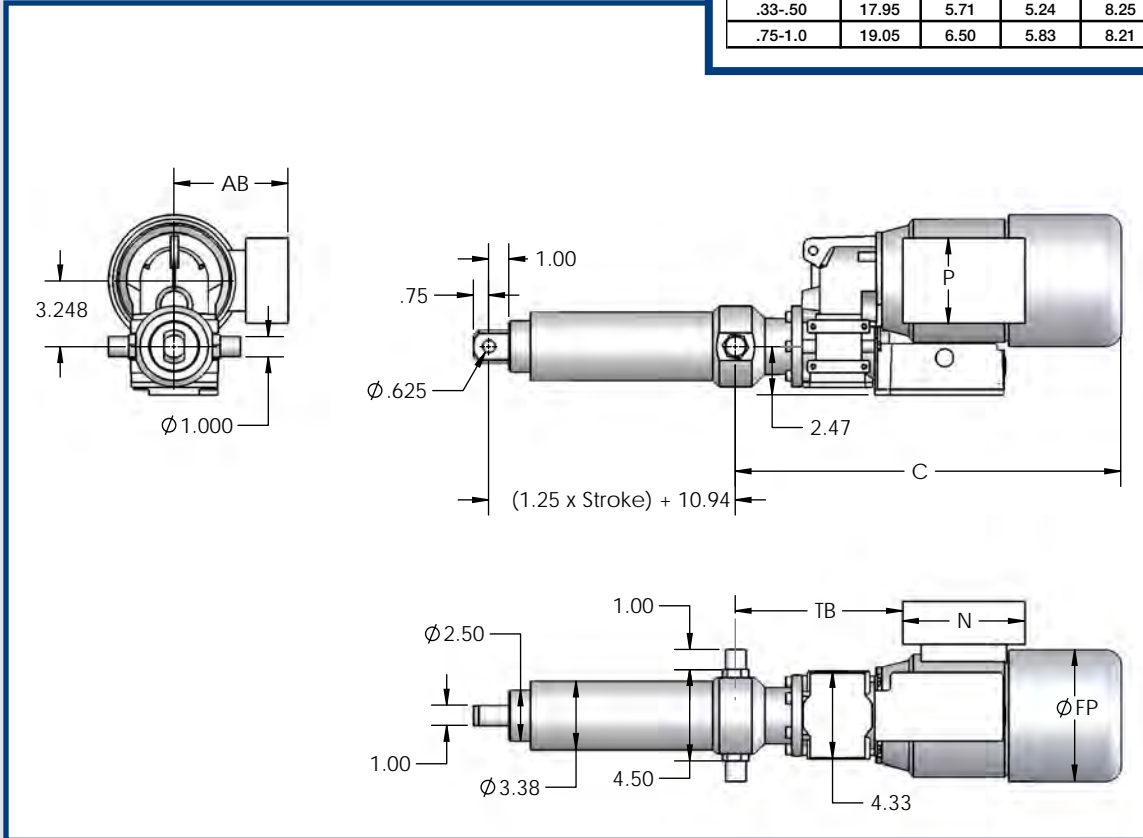
- Easy to install - reduces installation costs
- Custom designed for your application
- Low maintenance design - easy to maintain after installation
- Long product life expectancy
- Ball screw
- Ductile iron housing
- Chrome plated translating tube
- Adjustable end of stroke limit switches
- Clevis and trunnion mounting
- Motor configuration include: parallel, right angle and off set

Options

- Food grade component options available
- Product designs for outdoor applications
- Manual override
- Other special packages are available upon your application needs



Motor HP	C	FP	AB	TB	N	P
.16-.25	17.00	5.17	4.84	7.94	5.20	3.43
.33-50	17.95	5.71	5.24	8.25	5.20	3.43
.75-1.0	19.05	6.50	5.83	8.21	6.02	4.25



3 Ton Electric Cylinder (SCN) - Off Set Motor

Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/min	mm/min	in	mm	HP	kW
NZ03-0424	2,134	9,492	6, 12, 18, 24, 36	152, 304, 457, 609, 914	10.94 (277) + (1.25 x stroke)	165.6	4,206	61	1,549	1	0.74
NZ03-0534	2,687	11,952				131.5	3,340	61	1,549	1	0.74
NZ03-1166	2,934	13,051				60.2	1,529	61	1,549	1/2	0.37
NZ03-0635	3,196	14,216				110.6	2,809	61	1,549	1	0.74
NZ03-0864	3,261	14,505				81.3	2,065	61	1,549	3/4	0.56
NZ03-0949	3,582	15,933				74.0	1,880	59	1,499	3/4	0.56
NZ03-0726	3,654	16,253				96.7	2,456	59	1,499	1	0.74
NZ03-2235	3,712	16,511				31.4	798	58	1,473	1/3	0.24
NZ03-1879	4,728	21,031				37.4	950	52	1,321	1/2	0.37
NZ03-4185	5,265	23,419				16.8	427	49	1,245	1/4	0.19
NZ03-8171	6,000	26,689				8.6	218	44	1,118	1/6	0.12
NZ03-5933	6,000	26,689				11.8	300	41	1,041	1/4	0.19
NZ03-3773	6,000	26,689				18.6	472	45	1,143	1/3	0.24

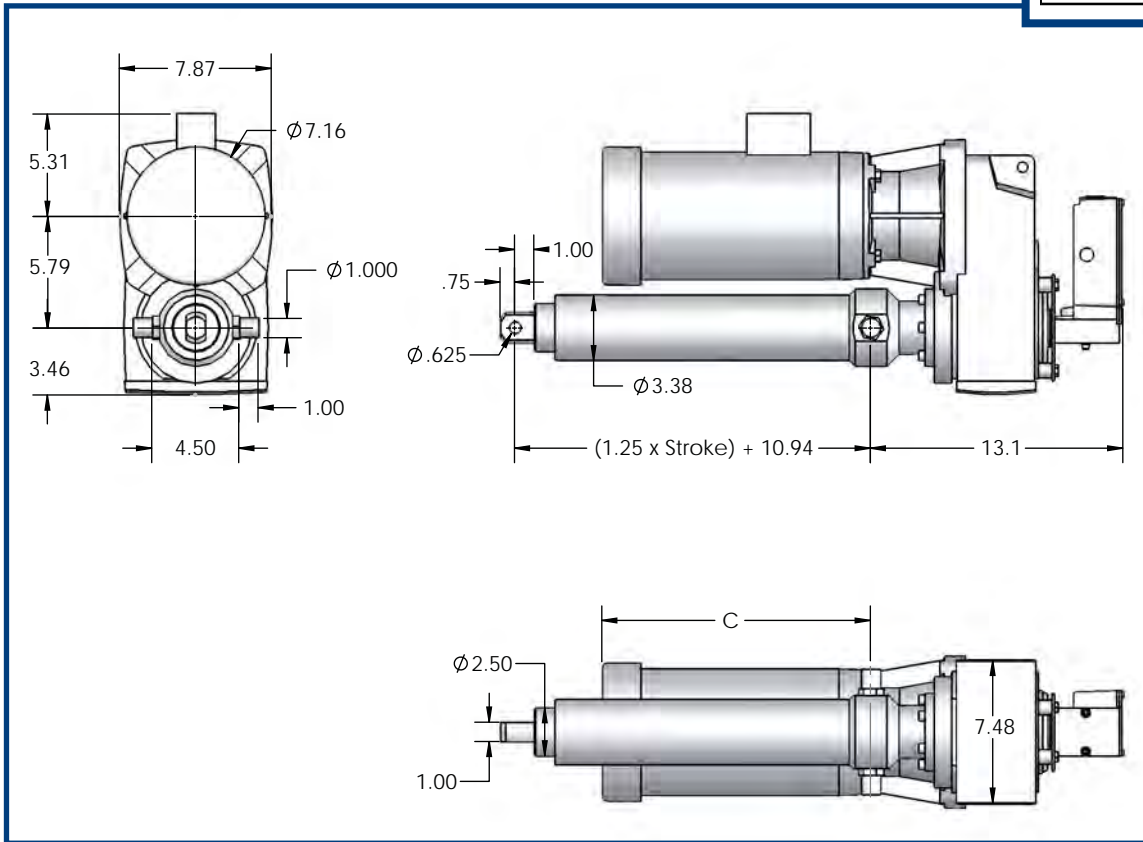
Consult factory for additional speeds and capacities

Stroke lengths are available in 1" increments, please contact factory for details

SCN03 SERIES



Motor HP	C
1/3	11.92
1/2-3/4	13.42
1	13.92
1 1/2	15.36

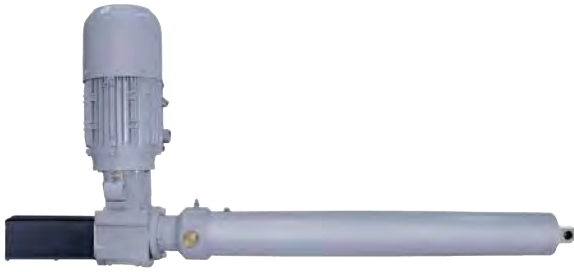


3 Ton Electric Cylinder (SCN) - Parallel Motor

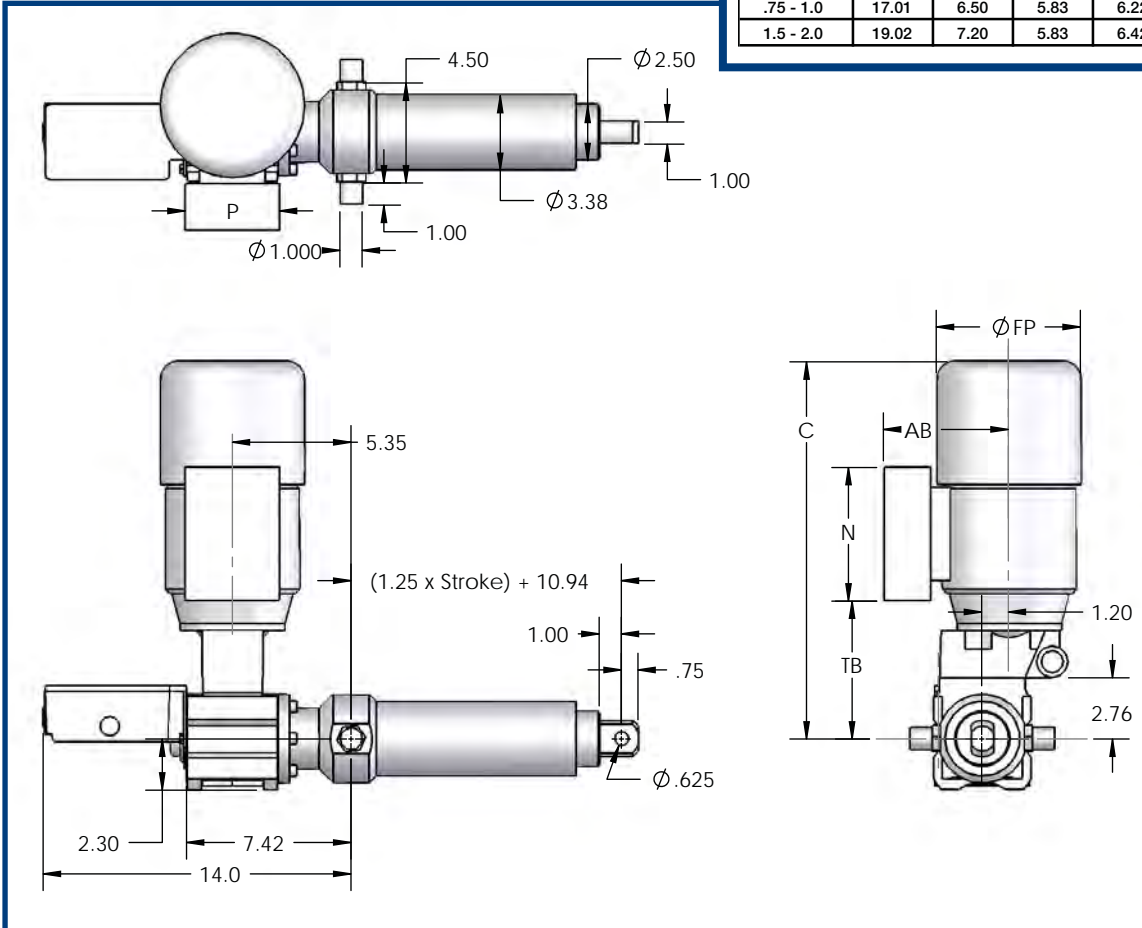
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/min	mm/min	in	mm	HP	kW
NU03-0572	2,879	12,806	6, 12, 18, 24, 36	152, 304, 457, 609, 914	10.94 (277) + (1.25 x stroke)	122.7	3,117	61	1,549	1	0.74
NU03-1181	2,972	13,220				59.4	1,509	61	1,549	1/2	0.37
NU03-1851	3,074	13,673				37.9	963	61	1,549	1/3	0.24
NU03-0837	3,159	14,051				83.9	2,131	61	1,549	3/4	0.56
NU03-2683	3,375	15,012				26.2	665	61	1,549	1/4	0.19
NU03-0451	3,404	15,141				155.7	3,955	61	1,549	1-1/2	1.11
NU03-4511	3,632	16,155				15.6	396	59	1,499	1/6	0.12
NU03-2965	3,730	16,599				23.7	602	58	1,473	1/4	0.19
NU03-1015	3,831	17,048				69.2	1,758	57	1,447	3/4	0.56
NU03-3123	3,929	17,484				22.5	571	57	1,447	1/4	0.19
NU03-1653	4,159	18,508				42.5	1,079	55	1,397	1/2	0.37
NU03-3718	4,678	20,817				18.9	480	52	1,321	1/4	0.19
NU03-6967	5,610	24,965				10.1	256	47	1,193	1/6	0.19
NU03-8242	6,000	26,700				8.5	216	44	1,117	1/6	0.19

Consult factory for additional speeds and capacities

Stroke lengths are available in 1" increments, please contact factory for details



Motor HP	C	FP	AB	TB	N	P
.16 - .25	14.96	5.17	4.84	5.94	5.20	3.43
.33 - .50	15.91	5.71	5.24	6.26	5.20	3.43
.75 - 1.0	17.01	6.50	5.83	6.22	6.02	4.25
1.5 - 2.0	19.02	7.20	5.83	6.42	6.02	4.25



3 Ton Electric Cylinder (SCN) - Right Angle Motor

Product Information

Part Number	Rated Load		Standard Stroke Lengths		Retracted Length in (mm)	Speed		Max Stroke		Motor	
	lbs	N	in	mm		in/min	mm/min	in	mm	HP	kW
NL03-0524	2,637	11,729	6, 12, 18, 24, 36	152, 304, 457, 609, 914	10.94 (277) + (1.25 x stroke)	134.0	3,404	61	1,549	1	0.74
NL03-1106	2,783	12,379				63.5	1,613	61	1,549	1/2	0.37
NL03-0385	2,906	12,926				182.4	4,633	61	1,549	1-1/2	1.11
NL03-1756	2,916	12,971				40.0	1,016	61	1,549	1/3	0.24
NL03-0787	2,970	13,211				89.2	2,266	61	1,549	3/4	0.56
NL03-2639	3,320	14,768				26.6	676	61	1,549	1/4	0.19
NL03-0899	3,393	15,092				78.1	1,984	61	1,549	3/4	0.56
NL03-4783	3,851	17,130				14.7	373	57	1,448	1/6	0.12
NL03-2328	3,866	17,197				30.2	767	57	1,448	1/3	0.24
NL03-3473	4,369	19,434				20.2	513	57	1,448	1/6	0.12
NL03-5465	4,400	17,130				12.8	325	54	1,372	1/6	0.12

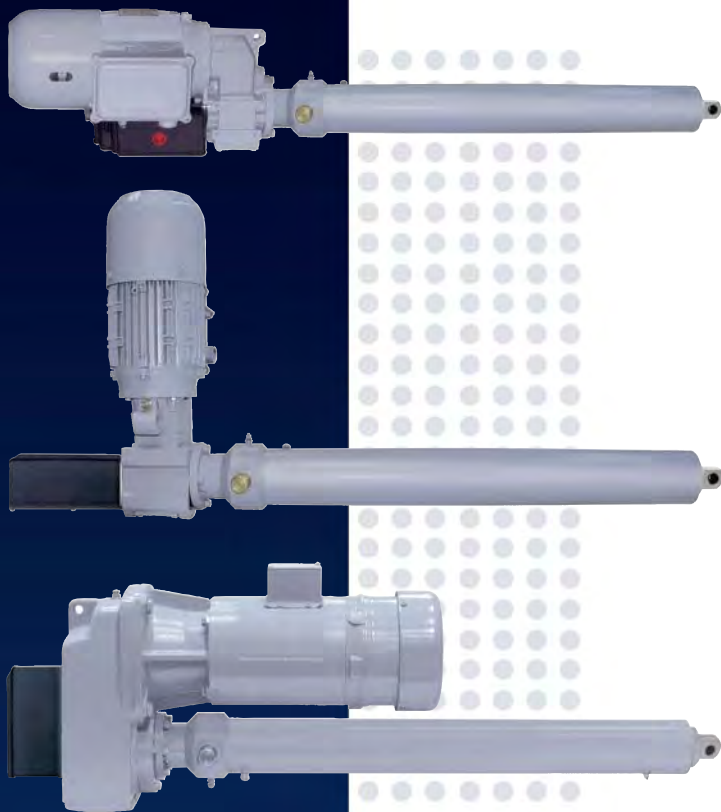
Consult factory for additional speeds and capacities

Stroke lengths are available in 1" increments, please contact factory for details

SCN06 SERIES

6 Ton

53 kN



Specifications

CAPACITY

6 Ton (53 kN)

BRAKE MOTOR

TEFC 230/460 Vac, 3 ph, 60 Hz

TEMPERATURE RANGE

0°F to 120°F (-18°C to 50°C)*

SPEEDS

Up to 320.8 in/min (8,147 mm/min)

STROKES

Up to 80 in (2,032 mm)

* For other temperatures please consult the factory

Features & Benefits

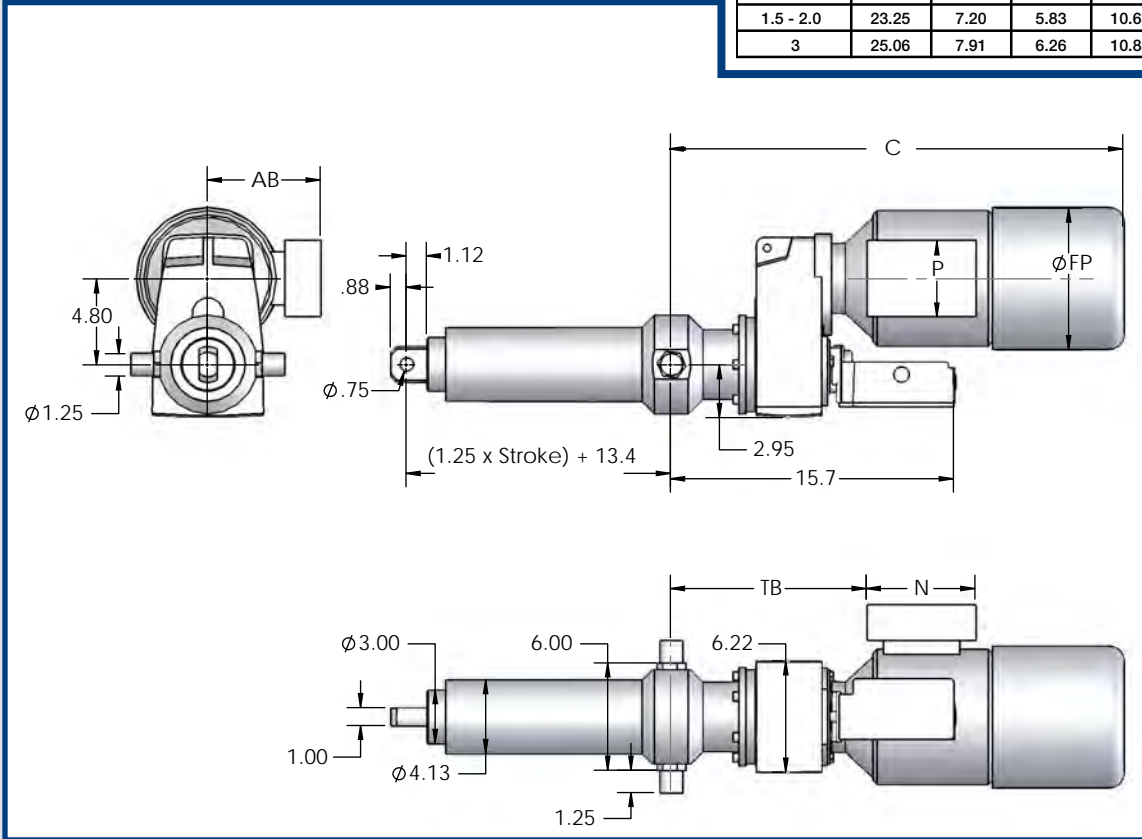
- Easy to install - reduces installation costs
- Custom designed for your application
- Low maintenance design - easy to maintain after installation
- Long product life expectancy
- Ball screw
- Ductile iron housing
- Chrome plated translating tube
- Adjustable end of stroke limit switches
- Clevis and trunnion mounting
- Motor configuration include: parallel, right angle and off set

Options

- Food grade component options available
- Explosion proof motor and limit switch
- Product designs for outdoor applications
- Manual override
- Other special packages are available upon your application needs



Motor HP	C	FP	AB	TB	N	P
.16 - .25	18.33	5.17	4.84	9.31	5.20	3.43
.33 - .50	20.00	5.71	5.24	10.14	5.20	3.43
.75 - 1.0	21.21	6.50	5.83	10.42	6.02	4.25
1.5 - 2.0	23.25	7.20	5.83	10.61	6.02	4.25
3	25.06	7.91	6.26	10.85	6.02	4.25



6 Ton Electric Cylinder (SCN) - Off Set Motor

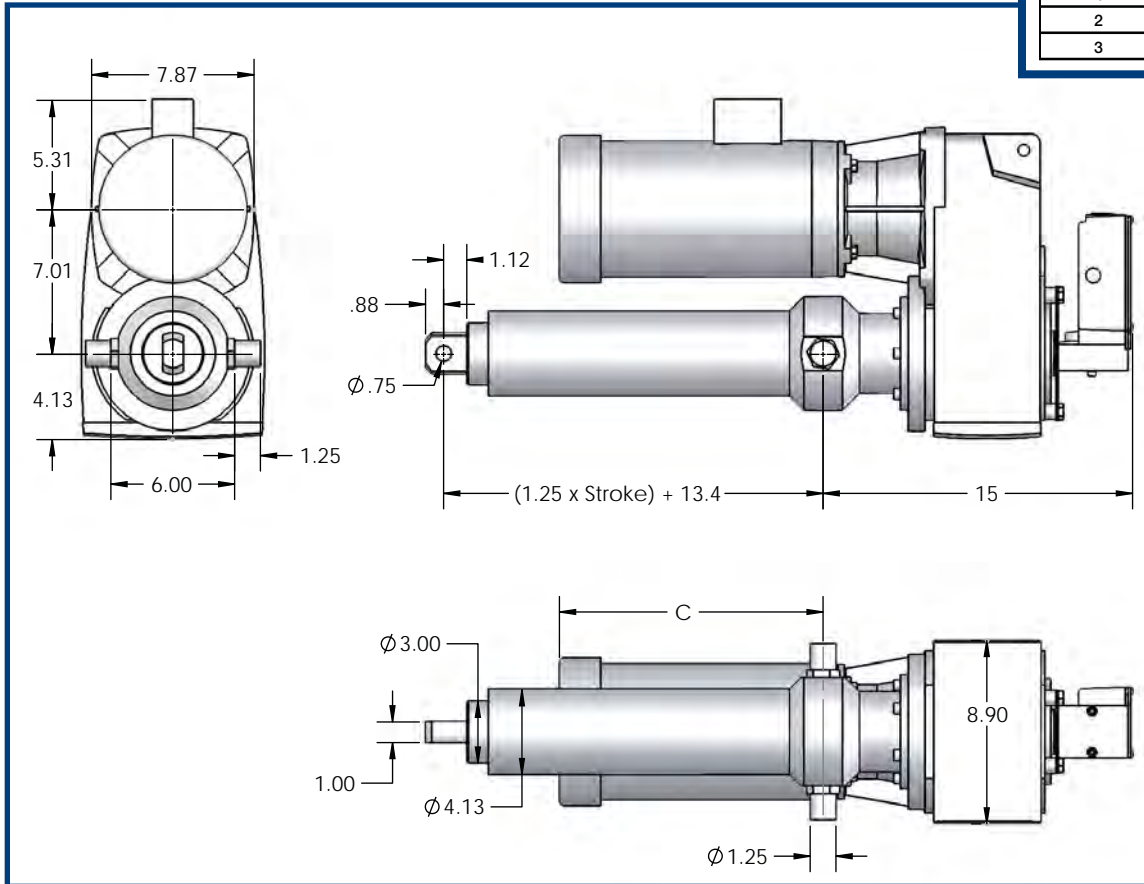
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/min	mm/min	in	mm	HP	kW
NZH6-0479*	4,942	21,983	6, 12, 18, 24, 36	152, 304, 457, 609, 914	13.4 (340) + (1.25 x stroke)	354.9	9,014	80	2,032	5	0.00
NZH6-0547*	5,643	25,101				310.8	7,894	80	2,032	5	0.00
NZ06-0643	5,645	25,112				125.3	3,183	80	2,032	2	1.49
NZ06-1411	6,194	27,553				57.1	1,451	78	1,981	1	0.74
NZ06-0479	6,308	28,061				168.2	4,273	77	1,956	3	2.20
NZH6-0643*	6,633	29,505				264.4	6,716	75	1,905	5	0.00
NZ06-1034	6,809	30,287				77.9	1,979	74	1,880	1-1/2	1.11
NZ06-0547	7,204	32,044				147.3	3,742	72	1,829	3	2.20
NZ06-1176	7,744	34,446				68.5	1,740	69	1,753	1-1/2	1.11
NZ06-0918	8,060	35,852				87.8	2,229	68	1,727	2	1.49
NZ06-2522	8,304	36,936				32.0	812	67	1,702	3/4	0.55
NZ06-4107	9,015	40,099				19.6	498	64	1,626	1/2	0.37
NZ06-2057	9,030	40,168				39.2	995	64	1,626	1	0.74
NZ06-7217	10,455	46,506				11.2	284	60	1,524	1/3	0.24
NZ06-3208	10,562	46,983				25.1	638	59	1,499	3/4	0.55
NZ06-7899	11,443	50,901				10.2	259	57	1,447	1/3	0.24
NZ06-8117	11,759	52,306				9.9	251	56	1,422	1/3	0.24
NZ06-10950	12,000	53,378				7.4	187	48	1,219	1/3	0.24
NZ06-11816	12,000	53,378				6.8	173	54	1,372	1/4	0.19
NZ06-15812	12,000	53,378				5.1	129	46	1,168	1/4	0.19
NZ06-5889	12,926	57,497	13.7	348	54	1,372	1/2	0.37			

Consult factory for additional speeds and capacities
Stroke lengths are available in 1" increments, please contact factory for details

SCN06 SERIES



Motor HP	C
1/3	11.16
1/2 3/4	12.86
1	13.18
1 1/2	14.18
2	15.16
3	16.04

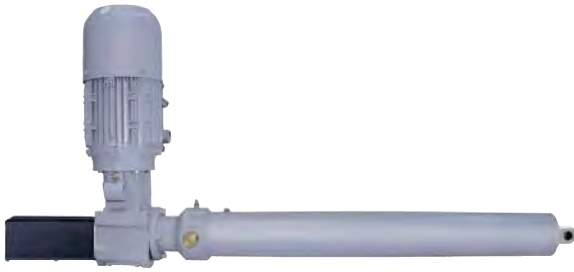


6 Ton Electric Cylinder (SCN) - Parallel Motor

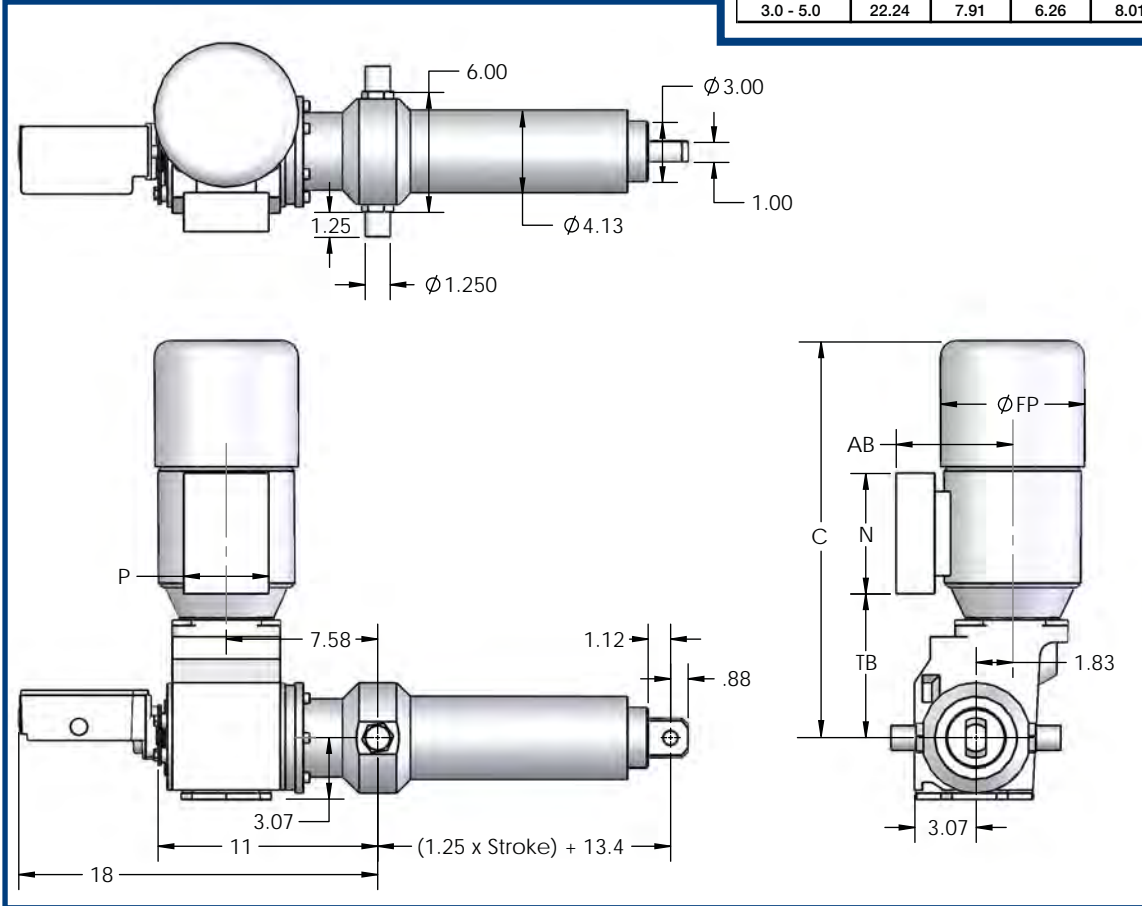
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length		Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)		in/min	mm/min	in	mm	HP	kW
NUH6-0448*	2,773	12,335	6, 12, 18, 24, 36	152, 304, 457, 609, 914	13.4 (340) + (1.25 x stroke)		379.5	9,639	80	2,032	3	2.20
NUH6-0670*	4,147	18,447					253.7	6,443	80	2,032	3	2.20
NU06-0831	7,296	32,454					97.0	2,463	72	1,829	2	1.49
NU06-1667	7,318	32,552					48.3	1,228	71	1,803	1	0.74
NU06-2371	7,806	34,722					34.0	863	69	1,753	3/4	0.55
NU06-3777	8,290	36,875					21.3	542	67	1,702	1/2	0.37
NU06-0670	8,823	39,251					120.3	3,055	65	1,651	3	2.20
NU06-6412	9,288	40,319					12.6	319	63	1,600	1/3	0.24
NU06-1411	9,291	41,328					57.1	1,451	63	1,600	1-1/2	1.11
NU06-6589	9,545	42,458					12.2	310	63	1,600	1/3	0.24
NU06-2245	9,855	43,837					35.9	912	62	1,575	1	0.74
NU06-1138	9,992	44,446					70.8	1,798	61	1,549	2	1.49
NU06-3193	10,513	46,764					25.2	641	60	1,524	3/4	0.55
NU06-5297	11,627	51,719					15.2	386	57	1,448	1/2	0.37
NU06-11223	12,000	53,378		7.2	182	48	1,219	1/3	0.24			

Consult factory for additional speeds and capacities

Stroke lengths are available in 1" increments, please contact factory for details



Motor HP	C	FP	AB	TB	N	P
.16 - .25	15.79	5.17	4.84	6.47	5.20	3.43
.33 - .50	16.73	5.71	5.24	7.30	5.20	3.43
.75 - 1.0	17.83	6.50	5.83	7.58	6.02	4.25
1.5 - 2.0	20.43	7.20	5.83	7.70	6.02	4.25
3.0 - 5.0	22.24	7.91	6.26	8.01	6.02	4.25



6 Ton Electric Cylinder (SCN) - Right Angle Motor

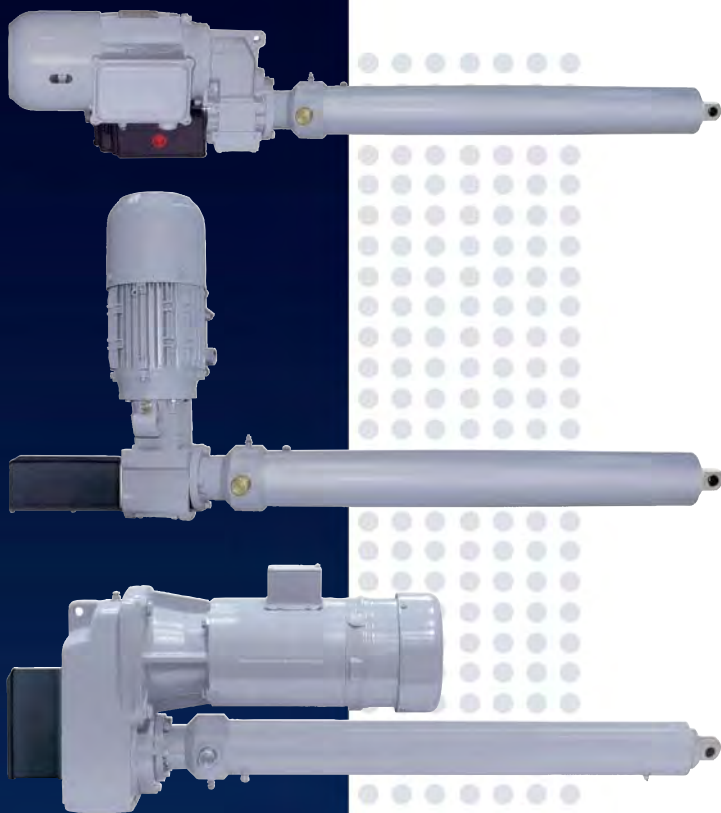
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/min	mm/min	in	mm	HP	kW
NLH6-0530	3,280	14,594	6, 12, 18, 24, 36	152, 304, 457, 609, 914	13.4 (340) + (1.25 x stroke)	320.8	8147.0	80	2,032	3	2.20
NLH6-0947	3,907	17,383				179.5	4560.0	80	2,032	2	1.49
NLH6-0732	4,531	20,154				232.2	5898.0	80	2,032	3	2.20
NLH6-0829	5,131	22,823				205.1	5209.0	80	2,032	3	2.20
NL06-0530	6,980	31,048				152.0	3860.0	73	1,854	3	2.20
NL06-0829	7,278	32,376				97.2	2469.0	72	1,829	2	1.49
NL06-1706	7,489	33,312				47.2	1200.0	71	1,803	1	0.74
NL06-1139	7,500	33,362				70.7	1797.0	71	1,803	1-1/2	1.11
NL06-2433	8,011	35,632				33.1	841.0	68	1,727	3/4	0.55
NL06-3862	8,477	37,707				20.9	530.0	68	1,676	1/2	0.37
NL06-0649	8,547	38,018				124.2	3155.0	66	1,676	3	2.20
NL06-6285	9,105	40,500				12.8	326.0	64	1,626	1/3	0.24
NL06-1084	9,517	42,335				74.3	1888.0	63	1,600	2	1.49
NL06-0732	9,640	42,882				110.1	2796.0	62	1,575	3	2.20
NL06-3132	10,312	45,870				25.7	653.0	60	2,032	3/4	0.55
NL06-3380	11,129	49,502				23.8	606.0	58	1,473	3/4	0.55
NL06-5500	12,000	53,378	14.7	372.0	56	1,422	1/2	0.37			

Consult factory for additional speeds and capacities
 Stroke lengths are available in 1" increments, please contact factory for details

SCN12 SERIES

12 Ton

106.7 kN



Specifications

CAPACITY

12 Ton (106.7 kN)

BRAKE MOTOR

TEFC 230/460 Vac, 3 ph, 60 Hz

TEMPERATURE RANGE

0°F to 120°F (-18°C to 50°C)*

SPEEDS

Up to 188.5 in/min (4,787 mm/min)

STROKES

Up to 110 in (2,794 mm)

* For other temperatures please consult the factory

Features & Benefits

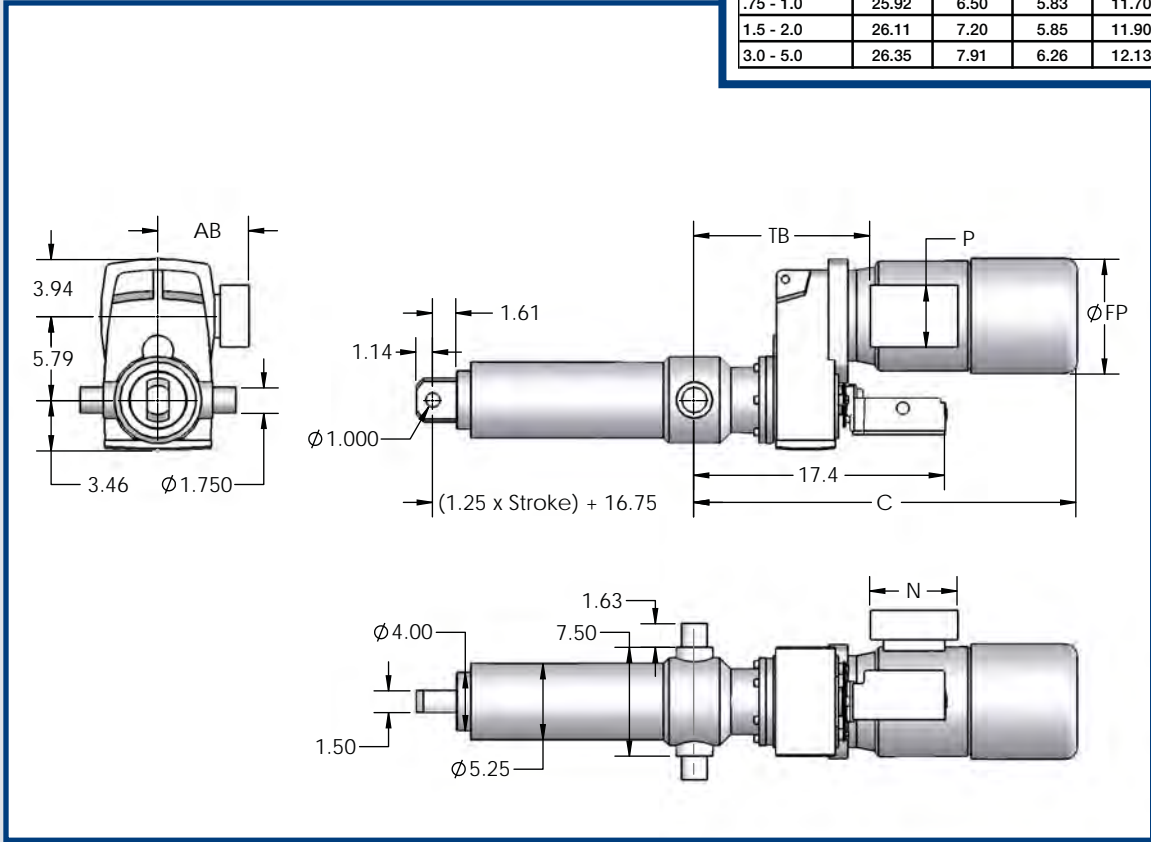
- Easy to install - reduces installation costs
- Custom designed for your application
- Low maintenance design - easy to maintain after installation
- Long product life expectancy
- Ball screw
- Ductile iron housing
- Chrome plated translating tube
- Adjustable end of stroke limit switches
- Clevis and trunnion mounting
- Motor configuration include: parallel, right angle and off set

Options

- Food grade component options available
- Explosion proof motor and limit switch
- Product designs for outdoor applications
- Manual override
- Other special packages are available upon your application needs



Motor HP	C	FP	AB	TB	N	P
.33 - .50	25.84	5.71	5.24	11.82	5.20	3.43
.75 - 1.0	25.92	6.50	5.83	11.70	6.02	4.25
1.5 - 2.0	26.11	7.20	5.85	11.90	6.02	4.25
3.0 - 5.0	26.35	7.91	6.26	12.13	6.02	4.25



12 Ton Electric Cylinder (SCN) - Off Set Motor

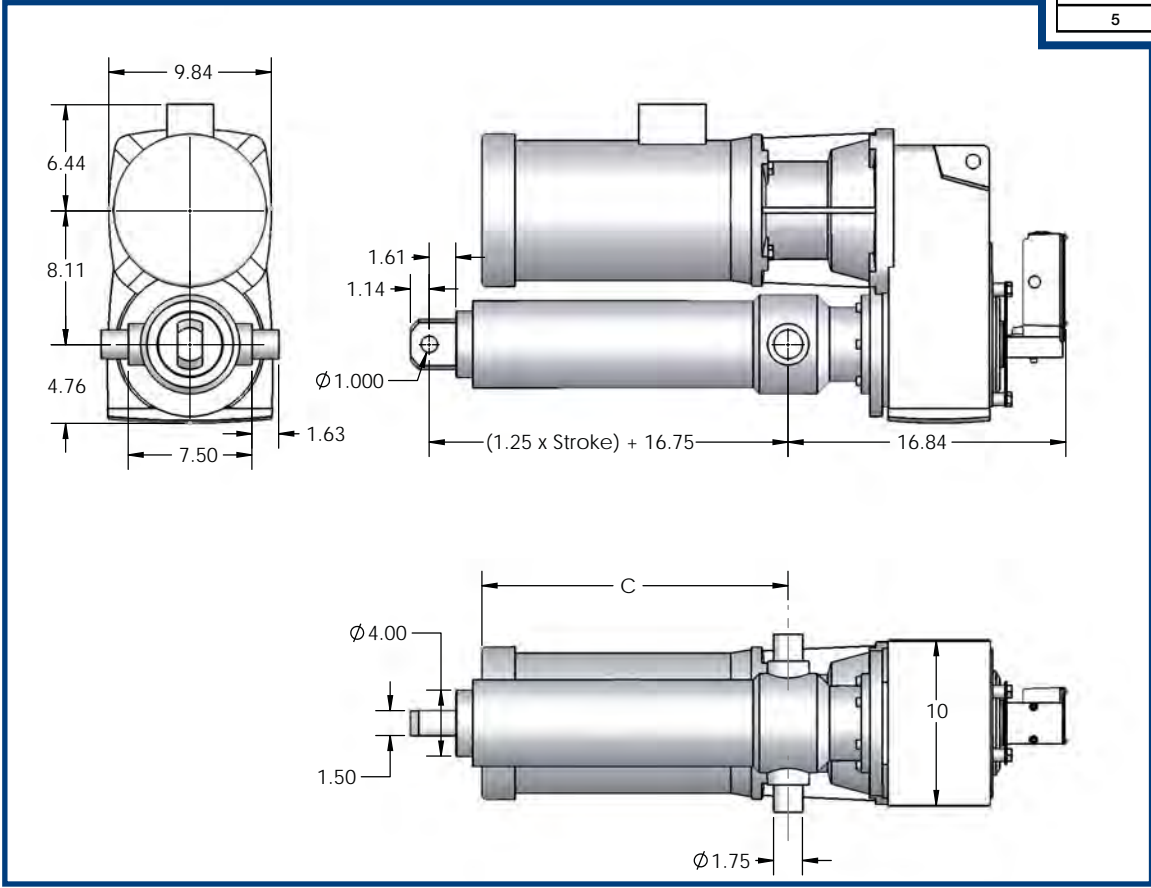
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/min	mm/min	in	mm	HP	kW
NZ12-0451	9,305	41,390	6, 12, 18, 24, 36	152, 304, 457, 609, 914	16.75 (425) + (1.25 x stroke)	188.5	4,787	110	2,794	5	3.72
NZ12-1181	14,620	65,031				72.0	1,828	110	2,794	3	2.23
NZ12-1851	15,277	67,950				45.9	1,116	110	2,794	2	1.49
NZ12-3718	15,343	68,244				22.9	581	110	2,794	1	0.74
NZ12-0748	15,433	68,649				113.6	2,885	110	2,794	5	3.72
NZ12-2683	16,607	73,869				31.7	805	110	2,794	1-1/2	1.12
NZ12-0837	17,270	76,821				101.6	2,581	110	2,794	5	3.72
NZ12-4511	18,615	82,803				18.8	477	108	2,743	1	0.74
NZ12-0903	18,631	82,874				94.1	2,390	107	2,717	5	3.72
NZ12-2396	19,774	87,959				35.5	902	104	2,641	2	1.49
NZ12-1653	20,464	91,022				51.4	1,306	102	2,591	3	2.23
NZ12-2497	20,608	91,664				34.0	865	102	2,591	2	1.49
NZ12-1015	20,942	93,151				83.7	2,127	101	2,565	5	3.72
NZ12-3654	22,618	100,603				23.3	591	97	2,464	1-1/2	1.12
NZ12-6967	24,000	106,752				12.2	310	85	2,159	1	0.74
NZ12-8242	24,000	106,752				10.3	262	91	2,311	3/4	0.56
NZ12-10407	24,000	106,752				8.2	207	80	2,032	3/4	0.56
NZ12-12751	24,000	106,752				6.7	169	89	2,261	1/2	0.37
NZ12-14996	24,000	106,752				5.7	144	82	2,082	1/2	0.37
NZ12-18511	24,000	106,752				4.6	117	91	2,311	1/3	0.25
NZ12-23611	24,000	106,752	3.6	91	80	2,032	1/3	0.25			
NZ12-27627	24,000	106,752	3.1	78	85	2,159	1/4	0.19			

Consult factory for additional speeds and capacities
 Stroke lengths are available in 1" increments, please contact factory for details

SCN12 SERIES

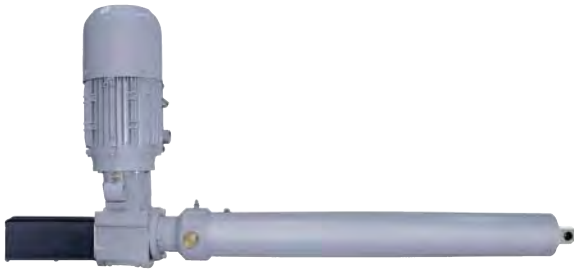


Motor HP	C
1/3	11.84
1/2 - 3/4	13.34
1	13.84
1 - 1/2	14.84
2	15.84
3	16.07
5	16.52

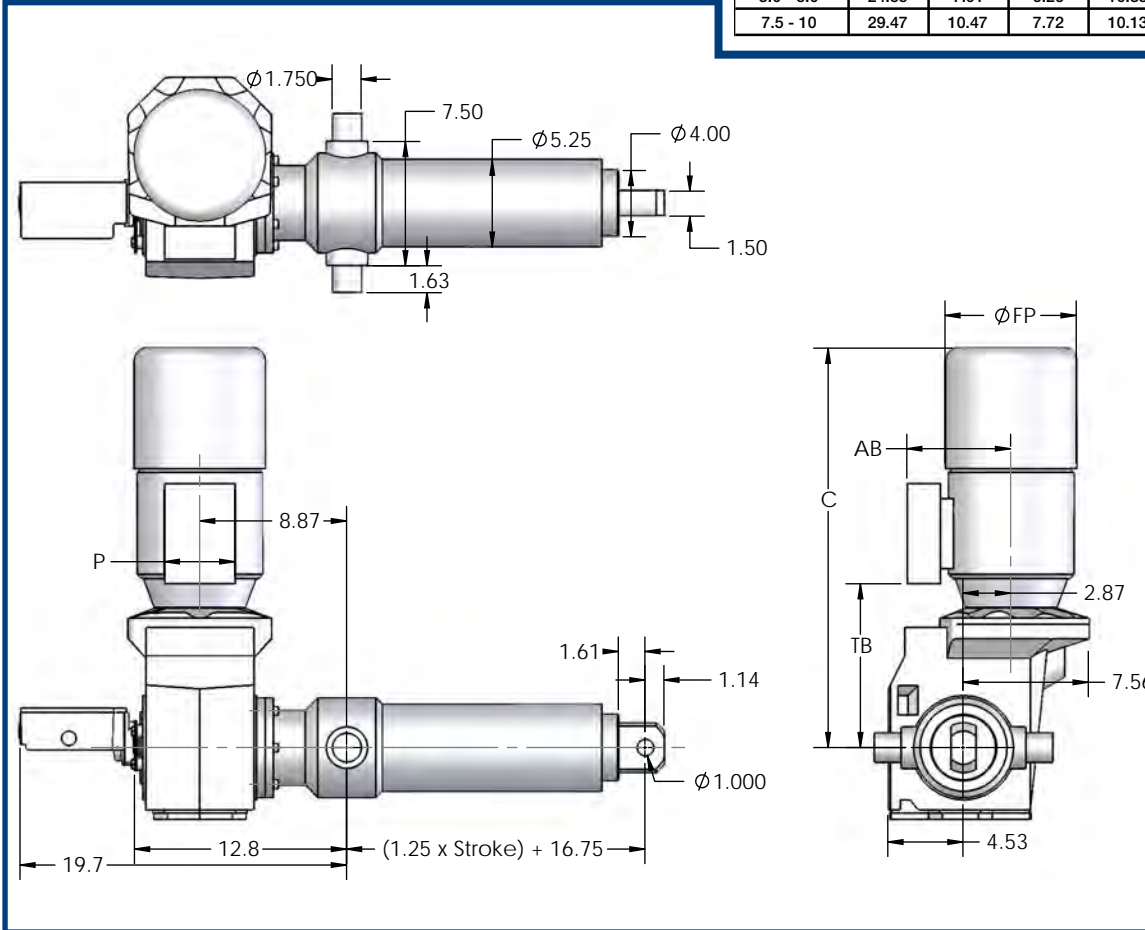


12 Ton Electric Cylinder (SCN) - Parallel Motor											
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/min	mm/min	in	mm	HP	kW
NU12-0470	9,697	43,134	6, 12, 18, 24, 36	152, 304, 457, 609, 914	16.75 (425) + (1.25 x stroke)	180.9	4,594	110	2,794	5	3.72
NU12-0543	11,204	49,838				156.5	3,975	110	2,794	5	3.72
NU12-0606	12,503	55,616				140.3	3,564	110	2,794	5	3.72
NU12-1818	15,004	66,738				46.8	1,188	110	2,794	2	1.49
NU12-1268	15,697	69,824				67.0	1,702	110	2,794	3	2.23
NU12-4074	16,812	74,783				20.9	531	110	2,794	1	0.74
NU12-0823	17,187	76,452				102.0	2,591	110	2,794	5	3.72
NU12-2145	17,703	78,746				39.6	1,006	110	2,794	2	1.49
NU12-4505	18,590	82,689				18.9	479	108	2,743	1	0.74
NU12-1520	18,817	83,702				55.9	1,420	107	2,717	3	2.23
NU12-0923	19,044	84,708				92.1	2,339	106	2,692	5	3.72
NU12-15540	21,162	94,128				5.5	139	100	2,540	1/3	0.25
NU12-2625	21,664	96,363				32.4	822	99	2,515	2	1.49
NU12-3681	22,785	101,347				23.1	587	96	2,438	1-1/2	1.12

Consult factory for additional speeds and capacities
 Stroke lengths are available in 1" increments, please contact factory for details



Motor HP	C	FP	AB	TB	N	P
.33 - .50	19.47	5.71	5.24	9.82	5.20	3.43
.75 - 1.0	20.89	6.50	5.83	9.90	6.02	4.25
1.5 - 2.0	22.73	7.20	5.85	10.09	6.02	4.25
3.0 - 5.0	24.55	7.91	6.26	10.33	6.02	4.25
7.5 - 10	29.47	10.47	7.72	10.13	7.28	5.47



12 Ton Electric Cylinder (SCN) - Right Angle Motor

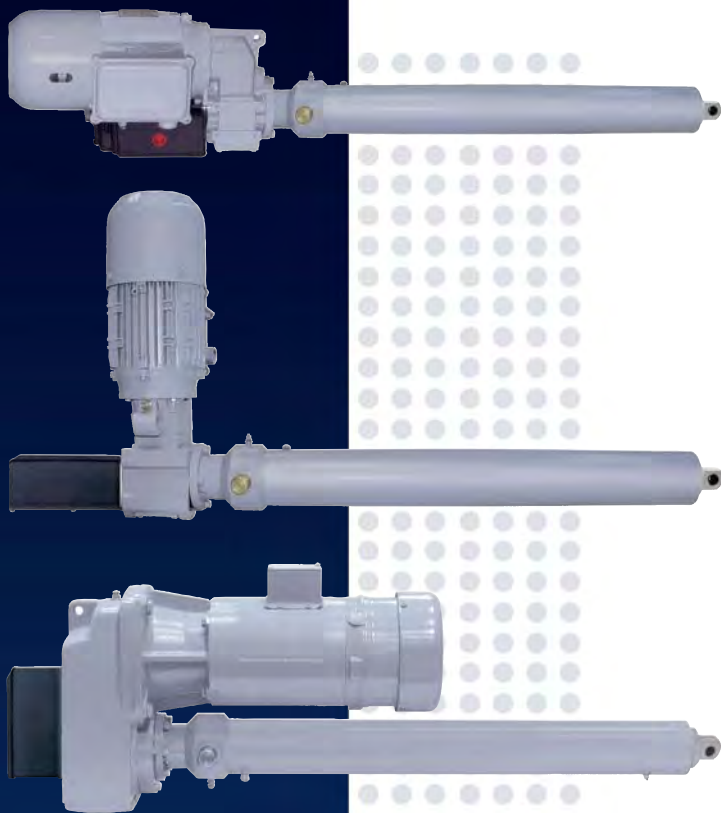
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/min	mm/min	in	mm	HP	kW
NL12-1783	14,715	65,454	6, 12, 18, 24, 36	152, 304, 457, 609, 914	16.75 (425) + (1.25 x stroke)	47.7	1,211	110	2,794	2	1.49
NL12-0481	14,887	66,215				176.7	4,489	110	2,794	7-1/2	5.50
NL12-0760	15,681	69,749				111.8	2,841	110	2,794	5	3.72
NL12-0543	16,805	74,752				156.5	3,975	110	2,794	7-1/2	5.50
NL12-4077	16,824	74,833				20.8	530	110	2,794	1	0.74
NL12-2844	17,604	78,303				29.9	759	110	2,794	1-1/2	1.12
NL12-0855	17,641	78,471				99.4	2,525	110	2,794	5	3.72
NL12-0611	18,910	84,116				139.1	3,533	107	2,718	7-1/2	5.50
NL12-1560	19,312	85,901				54.5	1,384	105	2,667	3	2.23
NL12-6401	19,811	88,117				13.3	337	104	2,642	3/4	0.56
NL12-0641	19,838	88,241				132.8	3,368	104	2,642	7-1/2	5.50
NL12-2539	20,955	93,208				33.5	850	101	2,565	2	1.49
NL12-3661	22,661	100,796				23.2	590	97	2,464	1-1/2	1.12
NL12-5602	23,117	102,824				15.2	385	96	2,438	1	0.74

Consult factory for additional speeds and capacities
 Stroke lengths are available in 1" increments, please contact factory for details

SCN25 SERIES

25 Ton

222 kN



Specifications

CAPACITY

25 Ton (222 kN)

BRAKE MOTOR

TEFC 230/460 Vac, 3 ph, 60 Hz

TEMPERATURE RANGE

0°F to 120°F (-18°C to 50°C)*

SPEEDS

Up to 259.7 in/min (6,596 mm/min)

STROKES

Up to 161 in (4,089 mm)

* For other temperatures please consult the factory

Features & Benefits

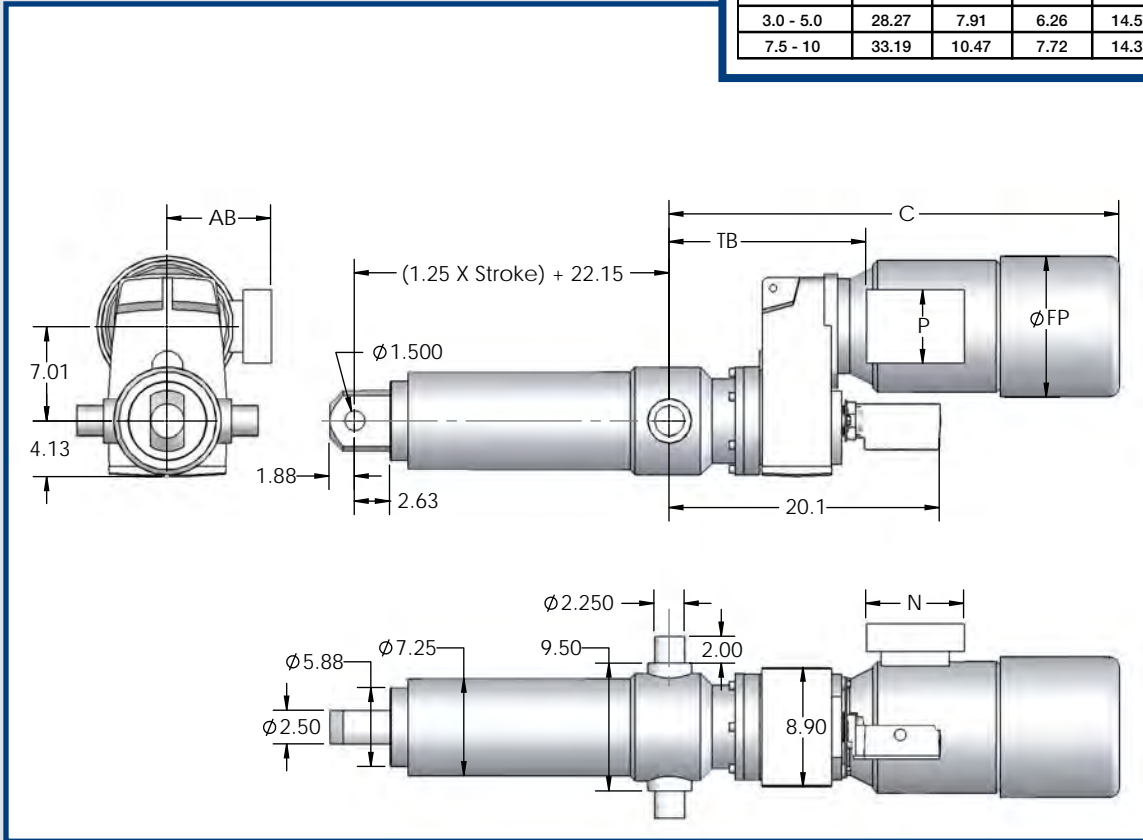
- Easy to install - reduces installation costs
- Custom designed for your application
- Low maintenance design - easy to maintain after installation
- Long product life expectancy
- Ball screw
- Ductile iron housing
- Chrome plated translating tube
- Adjustable end of stroke limit switches
- Clevis and trunnion mounting
- Motor configuration include: parallel, right angle and off set

Options

- Food grade component options available
- Explosion proof motor and limit switch
- Product designs for outdoor applications
- Manual override
- Other special packages are available upon your application needs



Motor HP	C	FP	AB	TB	N	P
.33 - .50	23.19	5.71	5.24	14.05	5.20	3.43
.75 - 1.0	24.41	6.50	5.83	14.13	6.02	4.25
1.5 - 2.0	26.45	7.20	5.83	14.33	6.02	4.25
3.0 - 5.0	28.27	7.91	6.26	14.57	6.02	4.25
7.5 - 10	33.19	10.47	7.72	14.37	7.28	5.47



25 Ton Electric Cylinder (SCN) - Off Set Motor

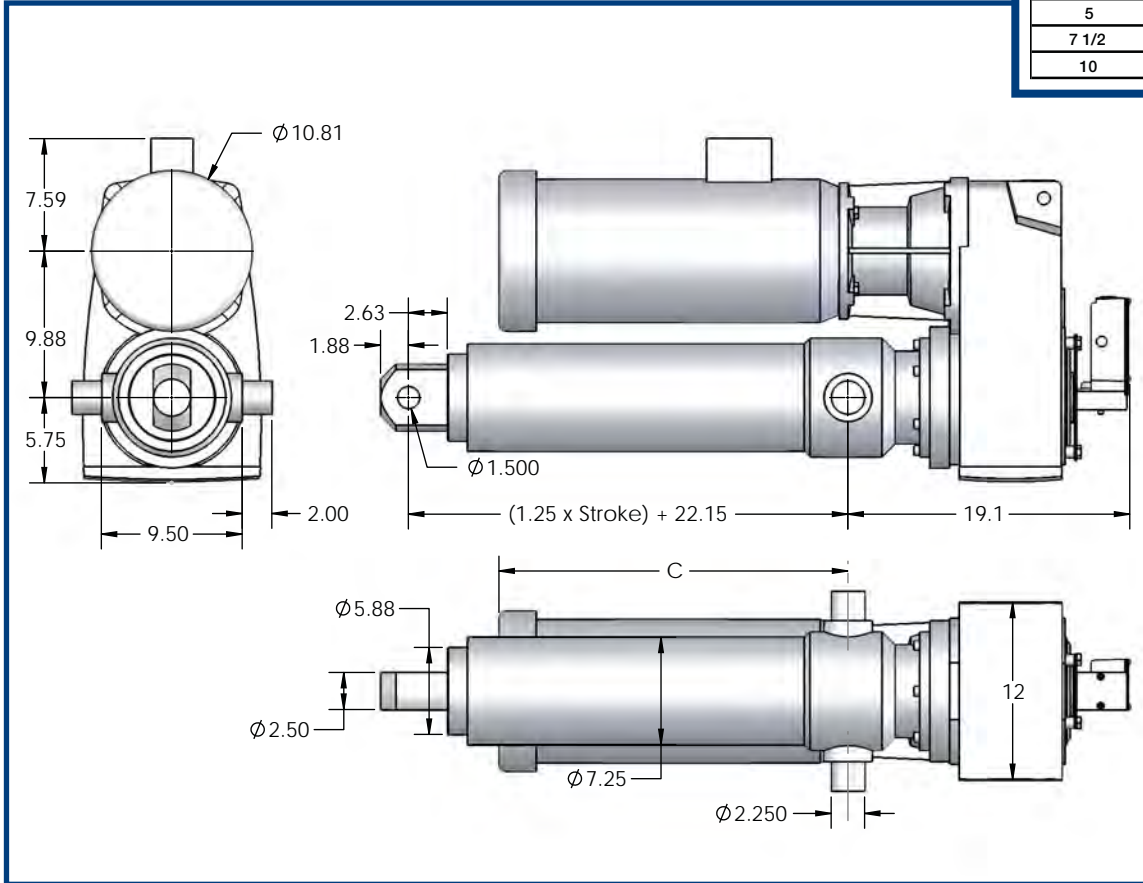
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/min	mm/min	in	mm	HP	kW
NZ25-0448	14,005	62,298	6, 12, 18, 24, 36	152, 304, 457, 609, 914	22.15 (562) + (1.25 x stroke)	250.4	6360.0	161	4,089	10	7.40
NZ25-2371	22,236	98,910				47.3	1201.0	161	4,089	3	2.23
NZ25-1667	26,057	115,907				67.3	1709.0	161	4,089	5	3.72
NZ25-1138	26,682	118,687				98.6	2504.0	161	4,089	7-1/2	5.52
NZ25-0980	30,637	136,277				114.5	2908.0	161	4,089	10	7.40
NZ25-1411	33,083	147,158				79.5	2019.0	160	4,064	7-1/2	5.52
NZ25-2245	35,091	156,092				50.0	1269.0	155	3,937	5	3.72
NZ25-12693	39,681	176,506				8.8	224.0	146	3,708	1	0.74
NZ25-6412	40,090	178,328				17.5	444.0	145	3,683	2	1.49
NZ25-40858	42,151	187,494				2.7	70.0	141	3,581	1/3	0.25
NZ25-19069	44,710	198,877				5.9	149.0	137	3,479	3/4	0.56
NZ25-28714	44,883	199,645				3.9	99.0	137	3,479	1/2	0.37
NZ25-10088	47,305	210,422				11.1	282.0	133	3,378	1-1/2	1.12
NZ25-5297	49,678	220,977				21.2	538.0	130	3,302	3	2.23
NZ25-48256	49,783	221,442				2.3	59.0	130	3,302	1/3	0.25
NZ25-23083	50,000	222,409				4.9	123.0	125	3,175	3/4	0.56
NZ25-16146	50,000	222,409				6.9	176.0	129	3,076	1	0.74
NZ25-11223	50,000	222,409				10.0	254.0	127	3,225	1-1/2	1.12
NZ25-8874	50,000	222,409				12.6	321.0	123	3,124	2	1.49

Consult factory for additional speeds and capacities
 Stroke lengths are available in 1" increments, please contact factory for details

SCN25 SERIES



Motor HP	C
1/2 - 3/4	14.12
1	14.82
1 - 1/2	15.80
2	16.80
3	16.86
5	17.31
7 1/2	22.79
10	25.49



25 Ton Electric Cylinder (SCN) - Parallel Motor

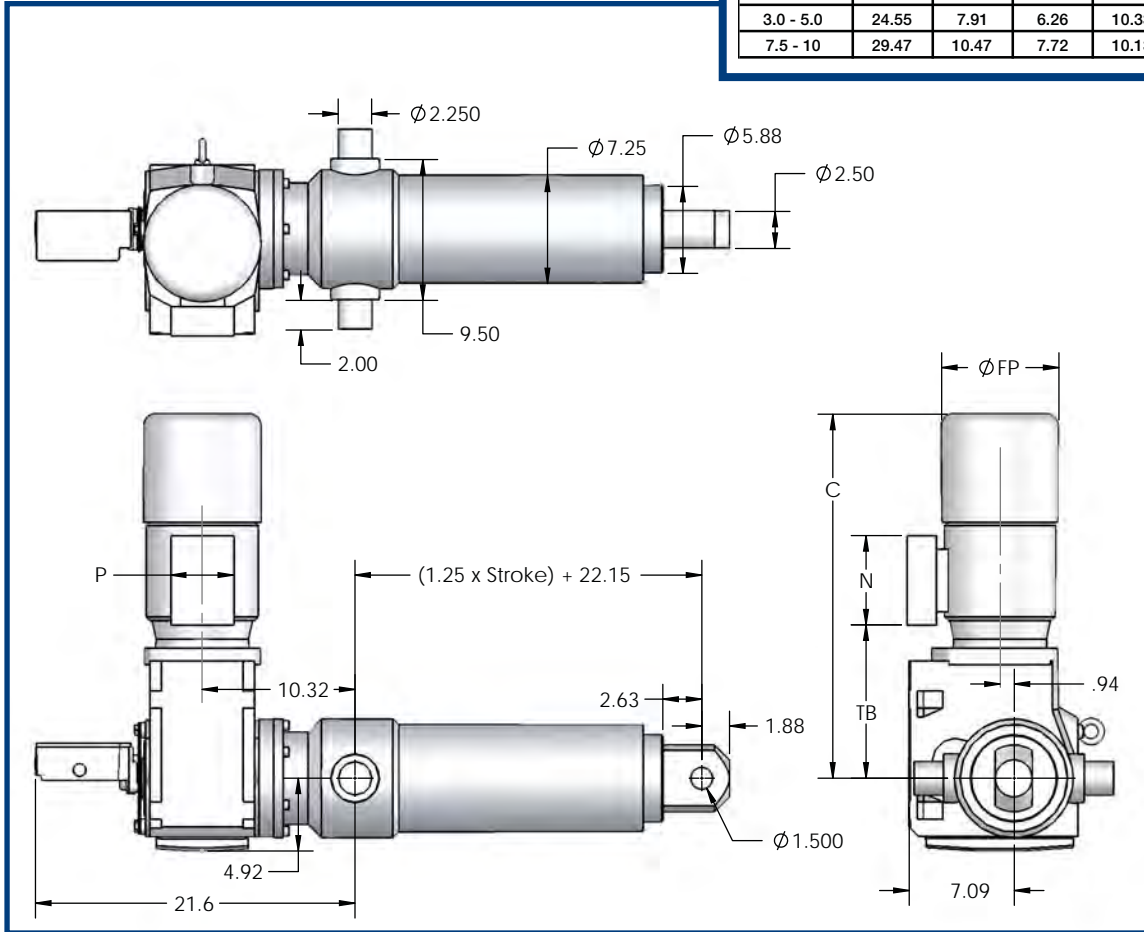
Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/min	mm/min	in	mm	HP	kW
NU25-0432	13,505	60,073	6, 12, 18, 24, 36	152, 304, 457, 609, 914	22.15 (562) + (1.25 x stroke)	259.7	6596.0	161	4,089	10	7.40
NU25-0571	17,850	79,401				196.5	4991.0	161	4,089	10	7.40
NU25-0717	22,415	99,707				156.5	3975.0	161	4,089	10	7.40
NU25-3050	28,605	127,238				36.8	934.0	161	4,089	3	2.23
NU25-2036	31,824	141,561				55.1	1400.0	161	4,089	5	3.72
NU25-3546	33,256	147,930				31.6	803.0	159	4,039	3	2.23
NU25-1538	36,060	160,403				73.0	1853.0	153	3,886	7-1/2	5.52
NU25-1300	40,640	180,775				86.3	2192.0	144	3,657	10	7.40
NU25-13403	41,900	186,379				8.4	213.0	142	3,606	1	0.74
NU25-1888	44,267	196,906				59.4	1509.0	138	3,505	7-1/2	5.52
NU25-5555	50,000	222,409				20.2	513.0	127	3,225	3	2.23
NU25-8161	50,000	222,409				13.7	349.0	129	3,276	2	1.49

Consult factory for additional speeds and capacities

Stroke lengths are available in 1" increments, please contact factory for details



Motor HP	C	FP	AB	TB	N	P
.33 - .50	19.47	5.71	5.24	9.82	5.20	3.43
.75 - 1.0	20.89	6.50	5.83	9.90	6.02	4.25
1.5 - 2.0	22.73	7.20	5.85	10.09	6.02	4.25
3.0 - 5.0	24.55	7.91	6.26	10.33	6.02	4.25
7.5 - 10	29.47	10.47	7.72	10.13	7.28	5.47



25 Ton Electric Cylinder (SCN) - Right Angle Motor

Part Number	Rated Load		Standard Stroke Lengths		Retracted Length	Speed		Max Stroke		Motor	
	lbs	N	in	mm	in (mm)	in/min	mm/min	in	mm	HP	kW
NL25-0848	26,510	117,921	6, 12, 18, 24, 36	152, 304, 457, 609, 914	22.15 (562) + (1.25 x stroke)	132.3	3360.0	161	4,089	10	7.40
NL25-2023	31,621	140,657				55.5	1409.0	161	4,089	5	3.72
NL25-3561	33,397	148,556				31.5	800.0	159	4,039	3	2.23
NL25-1073	33,544	149,211				104.6	2657.0	159	4,039	10	7.40
NL25-4036	37,852	168,374				27.8	706.0	149	3,785	3	2.23
NL25-1708	40,046	178,133				65.7	1668.0	145	3,683	7-1/2	5.52
NL25-6408	40,065	178,217				17.5	445.0	145	3,683	2	1.49
NL25-13944	43,591	193,900				8.0	204.0	139	3,530	1	0.74
NL25-29585	46,244	205,701				3.8	96.0	135	3,429	1/2	0.37
NL25-19745	46,295	205,927				5.7	144.0	135	3,429	3/4	0.56
NL25-29666	46,361	206,223				37.8	961.0	135	3,429	5	3.72
NL25-1573	49,175	218,738				71.3	1811.0	131	3,327	10	7.40
NL25-5917	50,000	222,409				19.0	482.0	123	3,124	3	2.23
NL25-9350	50,000	222,409				12.0	305.0	120	3,048	2	1.49

Consult factory for additional speeds and capacities
 Stroke lengths are available in 1" increments, please contact factory for details

MOUNTING COMPONENTS

Trunnion Blocks



ANSI Standard through holes, and black oxide finish

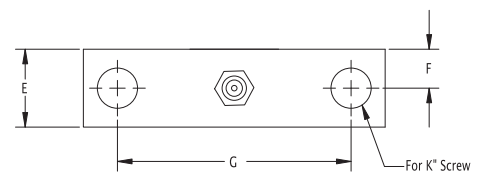
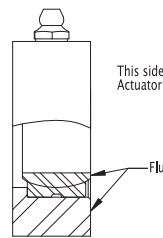
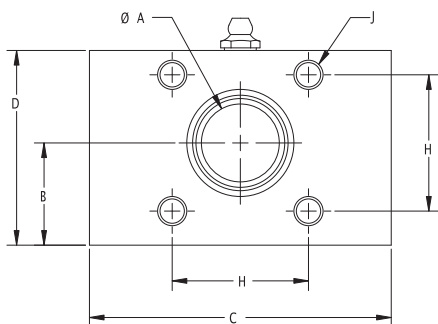


ANSI Standard tapped holes, and dust seals

Duff-Norton SCN and SCD SuperCylinders are available with trunnion mounting only and are fitted with trunnion pins as standard. The trunnion pins are designed to fit standard dimension radial spherical plain bearings (Torrington type SF, or SKF type GEZ, for example). Duff-Norton offers Trunnion Blocks to facilitate the installation of SCN and SCD series SuperCylinders. These blocks are solid steel and house properly sized spherical plain bearings. The blocks are drilled for mounting either as a conventional pillow blocks or as a flange units. Heat-treated fasteners should be used for all attachments.

If Duff-Norton Trunnion Blocks are not chosen for the SuperCylinder's installation, we strongly recommended that the trunnion pins be supported by some type of self-aligning bearing, as perfect alignment of trunnion support bearings is difficult to achieve. Standard pillow blocks are not recommended, as their maximum static load rating is usually less than that of the SuperCylinder. In addition, most pillow blocks use gray cast iron frames, which are subject to fracture under heavy loads.

Trunnion Block Specifications



Trunnion Block Specifications

Capacity	Part #	A	B	C	D	E	F	G	H	J	K
3 Ton	NZ03-510	1.00	1.31	3.87	2.50	1.00	0.50	3.00	1.75	3/8"-16	1/2"
6 Ton	NZ06-510	1.25	1.56	4.50	3.00	1.12	0.56	3.50	2.00	1/2"-13	5/8"
12 Ton	NZ12-510	1.75	2.06	5.50	4.00	1.50	0.75	4.25	2.75	5/8"-11	3/4"
25 Ton	NZ25-510	2.25	2.56	7.50	5.00	2.00	1.00	5.50	3.25	3/4"-10	1-1/4"

How to order:

SuperCylinder Series	Mounting Blocks (2 req'd)
NZ03, NL03, NU03	Part No. NZ03-510
NZ06, NL06, NU06	Part No. NZ06-510
NZ12, NL12, NU12	Part No. NZ12-510
NZ25, NL25, NU25	Part No. NZ25-510

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.

Notwithstanding 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

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

FREQUENTLY ASKED QUESTIONS

What are the advantages of using Duff-Norton linear actuators over other linear motion solutions?

Duff-Norton linear actuators offer a packaged solution to your motion requirements. The integration of the actuator and motor simplifies the process of specifying and purchasing components for your motion system. Also, Duff-Norton linear actuators offer many advantages over hydraulic cylinders when low maintenance, installation and operating costs and environmental impact are considerations. Regardless of how simple your requirements or how complex, Duff-Norton Controls are available for all electromechanical actuators and can be customized to suit your application. In addition, Duff-Norton's application engineers can help you determine which actuator best suits your application and environment.

Can two or more Duff-Norton linear actuators be synchronized?

Tandem actuators can be used in certain applications. Small differences in motor speed may cause the actuators to get out of synchronization. Use of clutch models allows alignment when actuator is fully extended or retracted. Contact Duff-Norton application engineers to discuss your application.

What is the difference between static load and dynamic load?

Dynamic, working, or lifting load is the force that will be applied to the actuator while it is in motion. Static load, also called holding load, is the force that will be applied to the actuator when it is not in motion.

What's duty cycle and how is it calculated?

Duty Cycle relates to the operation of the electric motor powering the actuator. It is the maximum amount of time the motor may run expressed as a percentage of total time. A 25% duty cycle indicates that the motor may be run intermittently for 15 minutes every hour.

Are Duff-Norton limit switches pre-set?

Duff-Norton does not preset limit switches on its linear actuators. Limit switches allow you the flexibility to set the limits of travel on your actuator to fit your particular application. Easy to follow instructions are included in the installation manual, and you may phone the factory if further assistance is required. The customer is responsible for properly setting the limit switch in the unit. If the limit switches are not set, or are improperly set, the unit may be damaged during operation. In addition, limit switches may require resetting if the translating tube of your actuator is rotated manually, as this will change the limit switch setting.

What are side loading and eccentric loading, and why should they be avoided?

Side loading, or radial loading, is a force applied perpendicular to the actuator center line. Eccentric loading is any force whose center of gravity does not act through the longitudinal axis of the actuator. Both side loading and eccentric loading should always be avoided as they can cause binding and shorten the life of the actuator.

What are the "Do's" and "Don'ts" of mounting Duff-Norton electromechanical actuators?

Duff-Norton linear actuators can be used in tension, compression, or combination applications. Eccentric and side loading should be avoided. Please consult the technical data sheets to ensure that all hardware used in conjunction with the actuator can withstand the maximum restraining torque.

What are the most common factors in the failure of a linear actuator?

Improper loading, failure to set limit switches, excessive duty and extreme environments may contribute to premature actuator failure.

Can I adjust the speed of a Duff-Norton linear actuator in the field?

No, typical lifting speeds at various capacities within the operating range of each actuator are graphed on the technical data sheets. Should you have an application which requires lower speed, our application engineers can recommend another model or, if required, one that is customized for your application.

Can Duff-Norton actuators perform complex tasks?

Yes. Complex positioning tasks can be managed through the use of position feedback devices and electronic controls.

What does the clutch do?

The friction disk clutch in Duff-Norton linear actuators is set to slip when the rated load limit of the actuator is exceeded. This is to prevent damage to the actuator due to jamming, or overheating resulting from an excessive load. The load will be held securely should the clutch slip. The clutch also allows end of travel protection, but is not designed to be slipped repeatedly. Select a Duff-Norton actuator with internal limit switches or install external limit switches; if a clutch model will be slipped repeatedly.

Do Duff-Norton linear actuators require maintenance?

Maintenance is minimal but Duff-Norton recommends periodic lubrication to maintain optimal performance. The installation and maintenance guide will give you specific instructions for your model.

Does Duff-Norton make larger linear actuators?

Duff-Norton's linear actuators are rated for capacities up to 2,000 lbs. Duff-Norton also offers a full line of mechanical actuators with capacities up to 250 tons, motorized actuators up to 75 tons. In addition, Duff-Norton also offers customized controls that may be used in conjunction with any actuation system.

How can I determine which Duff-Norton linear actuator is best suited for my application?

Technical information pertaining to each model is contained in individual technical data sheets (see enclosed literature request form.) Should you require any further assistance in selecting the proper actuator for your application, please call your local stocking distributor, or Duff-Norton's application engineering department at (800) 477-5002.

GLOSSARY

- Axial Load** A load whose center of gravity runs through the axis of the actuator screw
- Ball Brake** Used on smaller AC motor units, the ball brake is a bi-directional brake that limits drift when the unit is under a full load
- Cantilever Mount** A pin mount where the pin is not supported on both sides. Deflection of the pin can cause binding. This type of mount is unacceptable
- Current Draw** Amount of current (amperes) required by a motor to move a load. It increases as the load increases
- Cycle** A complete sequence of extension and retraction by the actuator
- Double Lead Screw** A double lead screw has two separate threads that wrap around the outside diameter of the screw. The advantage of this type of screw is the lifting nut will travel twice the distance with each single turn of the screw
- Duty Cycle** Percentage of time an actuator is in motion relative to total time. Example: If the total running time for an actuator is 20 seconds in every minute, the duty cycle is 33%
- Eccentric Load** A load whose center of gravity does not go through the screw axis. Off-center loads cause binding and shorten the actuator's life
- Extension/Retraction Rate** The speed at which an actuator extends and retracts. In DC models the speed can depend on the load
- Jog** To move the actuator in short increments
- Limit Switch** A device used to limit the extension or retraction of an actuator to a pre-set position
- Load** Material to be moved by the actuator
- Overload Clutch** A built-in device that slips when the actuator reaches a predetermined load limit preventing damage to the unit
- Peak Load** The maximum momentary load that an actuator can control
- Pivot Mount** A clevis mount that allows the actuator to pivot while in operation
- Potentiometer** A device that provides position feedback information from an actuator
- Restraining Torque** The amount of torque exerted on the brackets during operation
- Screw Pitch** The screw pitch is the distance from a point on a screw thread to the equivalent point on an adjacent thread
- Side Load** A load exerted on the side of the actuator housing or translating tube. Side loading can shorten the life of an actuator. Also called radial load
- Spring Brake** A bi-directional no-back type brake that is automatically activated by pinion torsion and released when the motor turns
- Spur Gear** A gear wheel with radial teeth parallel to its axis
- Static Load** The maximum load an actuator can hold when not operating
- Stroke Length** The total travel of the translating tube from retracted to fully extended
- Tension Load** A load that pulls on the actuator along the axis of its screw
- Translating Tube** The tube that extends in and out of the actuator
- Wiper Seal** A seal between the actuator housing and the translating tube to keep contaminants out of the actuator. Also called a scraper seal

Duff-Norton Also Manufactures...



Screw Jacks



Cubic Screw Jacks



**Bevel Gear
Screw Jacks**



Screws & Nuts



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