

MACHINE SCREW ACTUATORS – STAINLESS STEEL

2 to 100 TONS

Top Plate

316 stainless steel. Must be bolted to lifting member to prevent rotation except when screw is keyed.

Lifting Screw

316 stainless steel. Also available as threaded end or clevis end.

Shell Cap

316 stainless steel. Locked into place by set screws.

Carbon Steel Load Bearings

Top and bottom to take full load in either direction.

Worm Bearings & Seals

Both ends of worm. 316 stainless steel case and spring.

Worm Gear

Wear resistant Bronze. Accurately hobbled for greater gear contact.

Worm

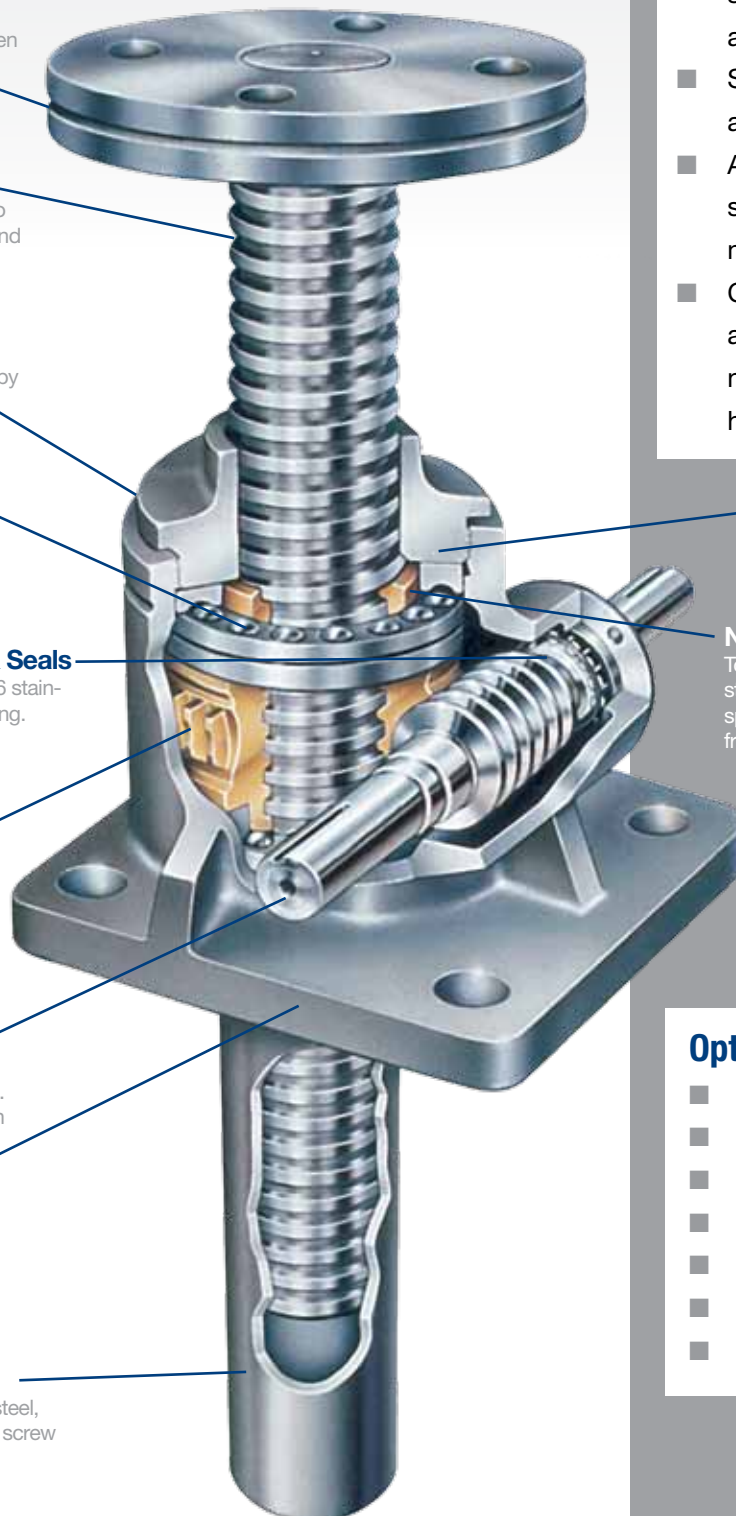
316 stainless steel. Standard. (17-4 Ph available)

Housing

316 stainless steel

Coverpipe

316 stainless steel, Protects lifting screw threads.



FEATURES

- Anti-backlash models available.
- Upright and inverted rotating screw models with traveling nut available.
- Sealed gear cavity keeps water and other contaminants out.
- Available with keyed lifting screws for translating screw models.
- Can be retrofitted into applications where Duff-Norton non-stainless steel actuators have been previously used.

Guide Bushing
Bronze

Nitrile Rubber Seals

Top and bottom with 316 stainless steel case and spring. Protects gearcase from contamination.

Optional Special Features:

- Closed heights
- Lifting screw ends
- Worm shaft extensions
- Lifting screw thread pitches
- Materials
- With stop nuts
- With boots

MACHINE SCREW

ACTUATORS – STAINLESS STEEL

MODEL NUMBERING SYSTEM

FL - TSM - 9002 - 6 - 1R

Model Prefix

R - Reducer
F - C-face Adapter
H - Hand Wheel
L - Limit Switch
E - Encoder
J - Rotary Counter

Screw End & Configuration

T - Threaded End
C - Clevis End
M - Top Plate
P - Plain End

K - Keyed Screw
CC - Double Clevis

D - Inverted Rotating
U - Upright Rotating

Series & Capacity No.

Series:
 Machine Screw
 (90xx, 18xx, 70xx, 25xx)
 Special MS
 (100xx, 20xx, 80xx, 35xx)

(1800 series base configurations are available only on 2 and 50 Ton models)

Capacities:
 Upright model suffixes end with the capacity number.
 Inverted model suffixes lower the capacity number by one digit.
 Rotating model suffixes raise the capacity number by one digit.

SM - Base Model

Travel

1" increment travels are always represented using the exact travel amount.

Travels with fractional lengths are quoted using that length, but are serialized when the order is processed.

Serialized digits in this position may also be used for other models containing special features.

Model Suffix

B - Boot
L - Single End Worm Ext. Left
R - Single End Worm Ext. Right
1 - Optional Ratio #1
2 - Optional Ratio #2
X - Supplied without cover pipe

NOTE

Not sure if your application requires the full protection offered by our Stainless Steel actuators? Contact our Customer Service group to explore your options as there have been many instances where Duff-Norton has supplied actuators with Stainless Steel screws, worm shaft, and with actuator housings protected by our Epoxy / Polyurethane paint process.

MACHINE SCREW ACTUATORS – STAINLESS STEEL PERFORMANCE TABLE

Performance Table Instructions – pages 15, 39, 46, 52, 55, and 76

When reviewing any Duff-Norton Actuator Performance Specifications Table, as part of the process of selecting the best-suited actuator for your application, there are several important worm-gear ratios to consider.

Standard Ratio – is frequently chosen when higher speeds and efficiency ratings are desired.

Optional Ratio – is frequently chosen when the application requires higher lifting capacities, lower speeds, or to ease the use of a handwheel.

Numeric Ratio – is frequently chosen for applications requiring fine adjustments, higher lifting capacities, lower speeds, the easy use of a handwheel, self locking applications, and also offers the benefit of an even number of worm input turns per inch of stroke.

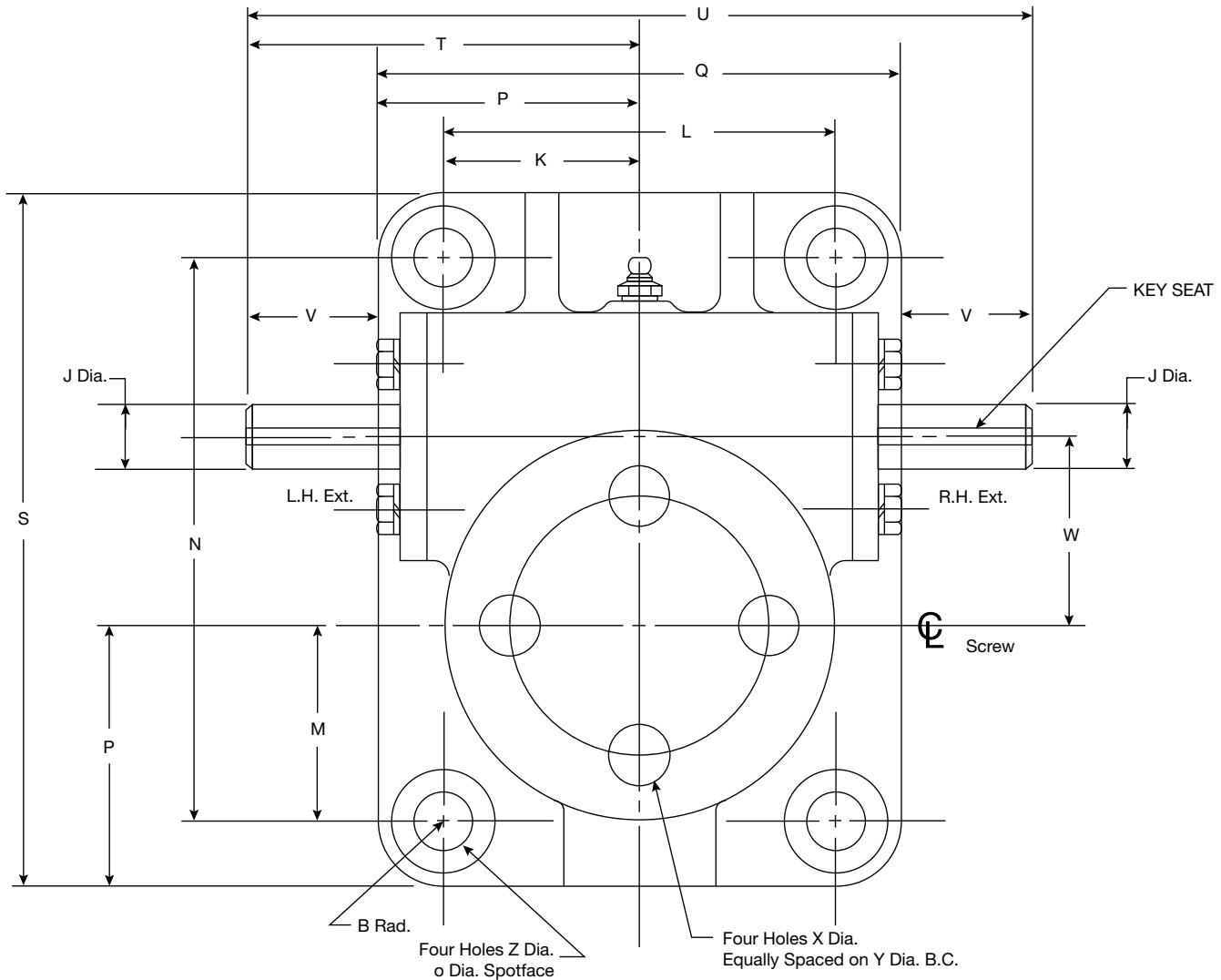
Performance Specifications - Machine Screw Actuator Stainless Steel											
Capacity (Tons) - 17-4PH Worm		2	5	10	15	20	25	30	35	50	100
Capacity (Tons) - 316 SS Worm		0.67	1.66	3.33	5.00	6.66	8.33	9.9	11.66	16.66	33.33
Lifting Screw	Diameter (in)	1	1-1/2	2	1-1/4	2-1/2	3	3	3-3/4	4-1/2	6
	Pitch (Std. & Opt.)	0.250	0.375	0.500	0.500	0.500	0.666	0.666	0.666	0.666	0.750
	Pitch (Numerical)	—	0.250	0.250	0.250	0.250	0.320	0.32	0.320	0.320	—
Worm Gear Ratios	Type	ACME	ACME	ACME	ACME	ACME	ACME	ACME	ACME	Mod, Sq.	Mod, Sq.
	Standard	6:1	6:1	8:1	8:1	8:1	10-2/3:1	10-2/3:1	10-2/3:1	10-2/3:1	12:1
	Optional No. 1	24:1	24:1	24:1	24:1	24:1	32:1	32:1	32:1	32:1	36:1
	Optional No. 2	12:1	12:1	—	—	—	—	—	—	—	—
Turns of Worm for 1 inch Stroke	Numeric Ratio	25:1	25:1	25:1	25:1	25:1	32:1	32:1	32:1	32:1	—
	Standard	24	16	16	16	16	16	16	16	16	16
	Optional No. 1	100	67	50	50	50	48	48	48	48	48
	Optional No. 2	50	33	—	—	—	—	—	—	—	—
Worm Torque at No Load (in-lb)	Numeric Ratio	100	100	100	100	100	100	100	100	100	100
	Standard	5	10	20	20	30	40	40	50	100	200
	Optional No. 1	5	10	20	20	30	40	40	50	100	200
	Optional No. 2	5	10	—	—	—	—	—	—	—	—
Maximum Horsepower per Actuator	Numeric Ratio	5	10	20	20	30	40	40	50	100	200
	Standard	2	4	5	5	5	8	8	8	15	25
	Optional No. 1	1/2	3/4	1-1/2	1-1/2	1-1/2	1-1/2	2-1/2	1-1/2	6	11
	Optional No. 2	3/4	2	—	—	—	—	—	—	—	—
Worm Torque at Full Load* (in-lb) 17-4PH Worm	Numeric Ratio	1/2	3/4	1-1/2	1-1/2	1-1/2	1-1/2	2-1/2	1-1/2	6	11
	Standard	120	450	750	1430	2050	2700	2640	4000	7500	16000
	Optional No. 1	50	185	400	820	1170	1700	1685	2400	4200	8600
	Optional No. 2	75	275	—	—	—	—	—	—	—	—
Worm Torque at Full Load* (in-lb) 316SS Worm	Numeric Ratio	48	175	370	640	925	1500	1800	2411	4040	—
	Standard	42	150	253	471	675	926	940	1366	2566	5466
	Optional No. 1	19	66	141	276	394	593	600	833	1466	3000
	Optional No. 2	27	95	—	—	—	—	—	—	—	—
Efficiency Rating (%) - 17-4PH Worm	Numeric Ratio	25	57	67	109	144	336	635	350	619	—
	Standard	22.1	22.1	26.5	20.9	22.0	22.4	22.4	17.4	13.3	12.4
	Optional No. 1	13.3	9.1	16.6	12.1	12.8	11.8	11.8	9.7	7.9	7.7
	Optional No. 2	17.7	18.1	—	—	—	—	—	—	—	—
Efficiency Rating (%) - 316SS Worm	Numeric Ratio	13.3	9.1	8.6	7.5	6.9	5.3	5.3	4.6	3.9	—
	Standard	20.3	21.1	25.1	20.3	18.8	17.9	17.9	17.0	12.9	12.1
	Optional No. 1	10.9	12.0	15.0	11.5	10.7	9.3	9.3	9.3	7.5	7.4
	Optional No. 2	15.5	16.8	—	—	—	—	—	—	—	—
Key Torque (in-lb) - 17-4PH Worm	Numeric	10.9	8.0	7.5	5.8	5.4	4.5	5.0	4.5	3.6	—
	Standard & Opt.	460	1750	4700	7580	10625	14000	16800	26500	47110	118200
Key Torque (in-lb) - 316SS Worm	Numeric	460	1599	4077	6645	9369	11474	13770	18561	30970	—
	Standard & Opt.	153	581	1565	2527	3538	4665	5600	8828	15697	39396
Weight with 6 inch Stroke (Raise) (lb)	Numeric	211	460	551	959	1199	2328	2800	2358	4087	—
	Standard & Opt.	17	35	52	66	93	160	160	240	410	1200
Weight per additional 1 inch Stroke (Raise) (lb)		0.3	0.9	1.4	1.5	2.6	2.5	2.5	3.7	5.5	9.0

*For loads from 25% to 100% of actuator capacity, torque requirements are approximately proportional to the load.

Note: Contact Duff-Norton Customer Service for motorized performance.

MACHINE SCREW ACTUATORS – STAINLESS STEEL

2 TO 100 TON CAPACITY

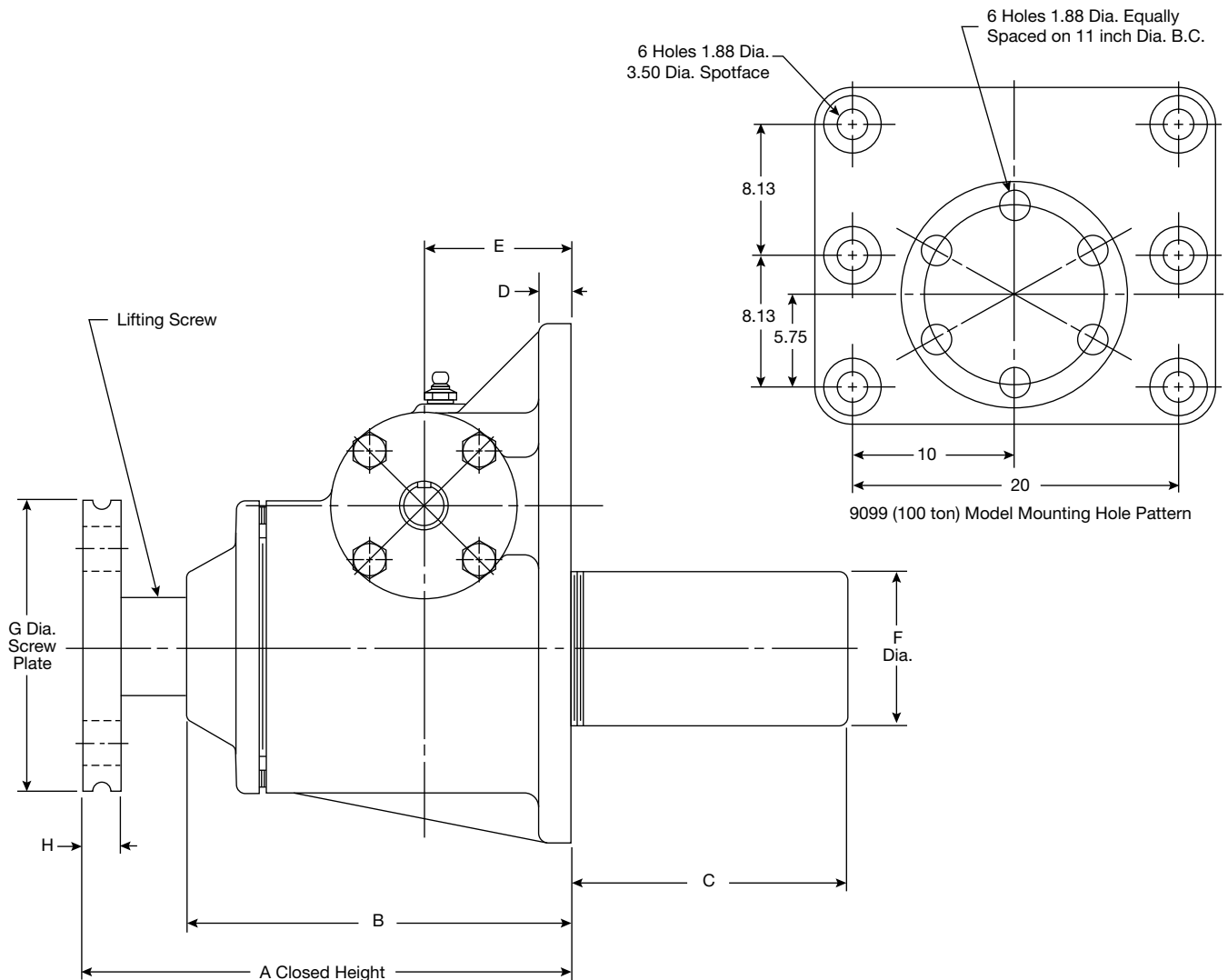


Product Specifications - Machine Screw Actuator Stainless Steel														
17-4 PH Worm Capacity (Tons)	316SS Worm Capacity (Tons)		A	B	C	D	E (±.005)	F	G	H	J (+.000/ -.002)	K	L	M
	Sustaining	Operating												
2 (1800 Series)	2	.67	5.50	4.56	Travel	.50	1.750	1.66	4.25	.50	.500	3.00	6.00	1.00
2 (9000 Series)	2	.67	5.50	4.56	Travel	.50	1.750	1.66	4.25	.50	.500	1.56	3.13	1.93
5	5	1.66	7.50	5.88	Travel	.50	2.250	2.38	4.50	.60	.749	2.25	4.50	2.25
10	10	3.33	7.75	5.62	Travel + 3/8	.50	2.250	2.88	5.75	.94	1.000	2.88	5.75	2.00
15	15	5.00	8.00	6.31	Travel + 9/16	.63	2.750	2.88	5.75	.94	1.000	3.00	6.00	2.50
20	20	6.66	10.25	7.13	Travel + 1/2	.75	3.250	3.50	5.75	.94	1.000	3.00	6.00	3.00
25 & 30	25	8.33	11.75	9.75	Travel + 1/4	1.00	4.000	4.50	8.50	.94	1.375	3.75	7.50	3.75
35	35	11.66	12.50	9.56	Travel + 1/4	1.25	4.000	4.50	10.50	1.31	1.375	3.75	7.50	4.50
50 (1800 Series)	50	16.66	13.50	11.38	Travel + 5/8	1.25	4.750	5.63	11.25	1.25	1.500	8.00	16.00	3.00
100	100	33.33	24.00	18.50	Travel + 1/2	1.50	6.000	7.00	14.00	2.94	1.750	10.00	20.00	5.75

Dimensions are subject to change without notice.

MACHINE SCREW ACTUATORS – STAINLESS STEEL

2 TO 100 TON CAPACITY

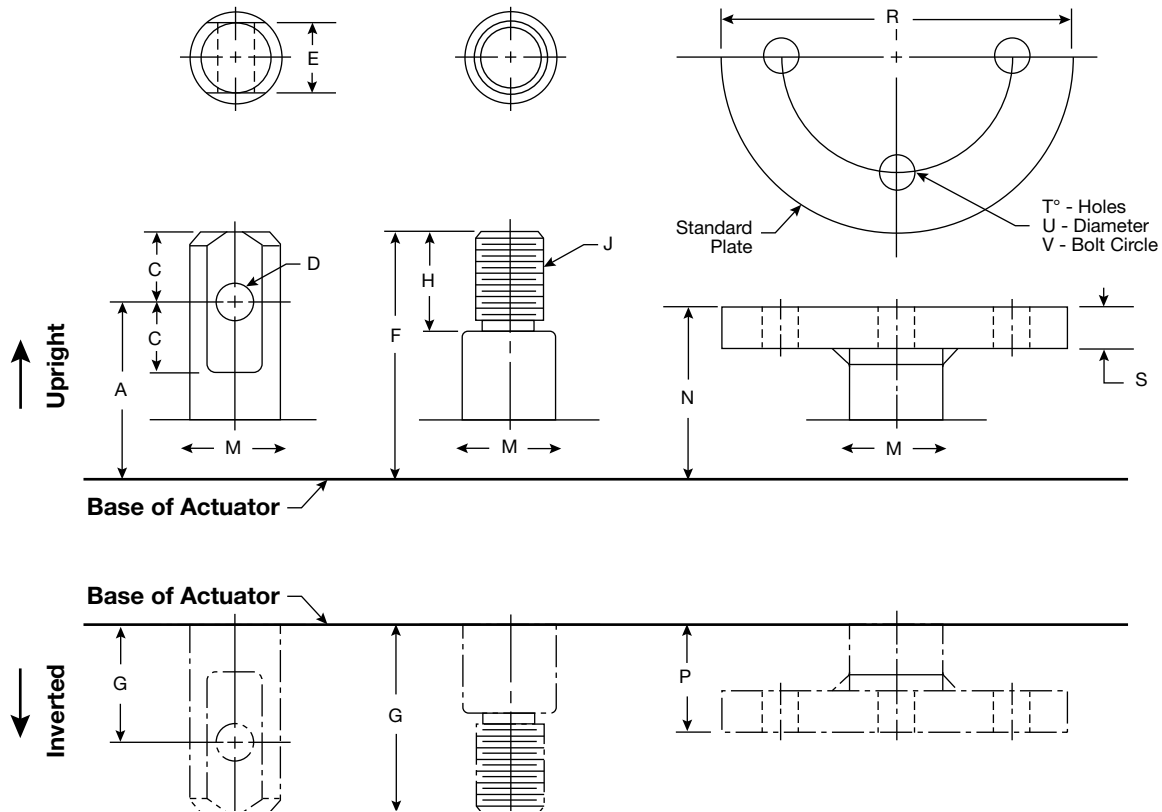


Product Specifications - Machine Screw Actuator Stainless Steel

N	P	Q	R	S	T	U	V	W	X	Y	Z	a	b	Keyseat	Lifting Screw
															(Dia./Pitch)
2.00	3.50	7.00	1.75	3.50	3.50	7.00	1.12	1.702 +.003/-0.000	.41	3.00	.41	.75	.5	.125 x .060 x 1.00 LG.	1.00 x .250
5.25	2.06	4.13	2.42	6.25	3.50	7.00	1.12	1.702 +.003/-0.000	.41	3.00	.41	.88	.38	.125 x .060 x 1.00 LG.	1.00 x .250
6.50	3.00	6.00	3.00	8.00	4.50	9.00	1.50	2.188 +.002/-0.000	.69	3.00	.69	1.19	.75	.188 x .094 x 1.25 LG.	1.50 x .375
7.00	3.75	7.50	2.88	8.75	5.50	11.00	1.80	2.598 +.003/-0.000	.81	4.13	.81	1.31	.88	.250 x .125 x 1.50 LG.	2.00 x .500
7.50	3.88	7.75	3.38	9.25	5.50	11.00	1.80	2.598 +.003/-0.000	.81	4.13	.81	1.38	.88	.250 x .125 x 1.50 LG.	2.25 x .500
8.75	4.13	8.25	4.13	11.00	5.50	11.00	1.50	2.598 +.003/-0.000	.81	4.13	1.12	1.75	1.13	.250 x .125 x 1.50 LG.	2.50 x .500
11.00	5.13	10.25	5.13	13.75	7.00	14.00	2.30	3.750 +.006/-0.000	1.06	6.00	1.38	2.13	1.38	.313 x .156 x 2.00 LG.	3.00 x .666
12.50	5.13	10.25	6.00	15.50	7.00	14.00	2.10	3.750 +.006/-0.000	1.62	7.75	1.62	2.63	1.38	.313 x .156 x 2.00 LG.	3.75 x .666
6.00	9.88	19.75	4.88	9.75	11.00	22.00	4.40	5.313 +.003/-0.000	1.38	8.75	1.88	3.25	1.88	.375 x .188 x 2.25 LG.	4.50 x .666
16.26	12.25	24.50	8.00	20.75	11.50	23.00	3.40	7.500 +.003/-0.000	1.88	11.00	1.88	3.50	2.25	.500 x .250 x 3.00 LG.	6.00 x .750

Dimensions are subject to change without notice.

MACHINE SCREW ACTUATORS – STAINLESS STEEL STANDARD SCREW END DIMENSIONS



Dimensions - Machine Screw Actuator Stainless Steel Screw End																	
Capacity	A**	B**	C	D	E	F**	G**	H	J	M	N**	P**	R	S	T	U	V
2 Ton SMS	5-1/4	1-3/4	3/4	23/32	3/4	6	2-1/2	1-1/8	3/4"-10UNC-2A	1	5-1/4	1-3/4	4-1/4	7/16	4	13/32	3
5 Ton SMS	7	2-1/2	1	21/32	1	8	2-1/2	1-1/8	1"-8UNC-2A	1-1/2	7-1/2	2-1/2	4-1/2	5/8	4	11/16	3
10 Ton SMS	7-1/2	3	1-1/4	25/32	1-1/4	9-1/4	4-1/4	1-5/8	1-1/2"-6UNC-2A	2	7-3/4	2-3/4	5-3/4	15/16	4	13/16	4-1/8
15 Ton SMS	8-1/2	3	1-1/4	29/32	1-1/2	10-1/4	4-1/4	2	1-3/4"-5UNC-2A	2-1/4	8-1/2	2-3/4	5-3/4	15/16	4	13/16	4-1/8
20 Ton SMS	10	3-1/2	1-1/2	1-1/32	1-3/4	12-1/2	5	2-1/4	2"-4 1/2UNC-2A	2-1/2	10-1/4	3	5-3/4	15/16	4	13/16	4-1/8
25 & 30 Ton SMS	12	4	1-3/4	1-9/32	2-1/4	14-1/2	5-3/4	3-1/4	2-1/2"4-UNC-2A	3	11-3/4	3	8-1/2	15/16	4	1-1/16	6
35 Ton SMS	13	5	2	1-17/32	2-1/2	15-1/2	7	3-3/4	3-1/4"-4UNC-2A	3-3/4	12-1/2	4	10-1/2	1-5/16	4	1-5/8	7-3/4
50 Ton SMS	15	5-1/2	2-1/2	1-21/32	3-1/4	18	8	4-1/4	4" 4UNC-2A	4-1/2	13-1/2	3-1/2	11-1/4	1-1/4	4	1-3/8	8-3/4
100 Ton SMS	24	9	3	2-17/32	4-1/4	25	12	5	2-1/2"-12UNC-2A	6	24	12	14	2-15/16	6	1-7/8	11

**Closed dimensions may increase for actuator units supplied with bellows boots. Consult Customer Service.

Note: Lifting screws listed above are not keyed, and i.c. must be held to prevent rotation.

Keyed lifting screws and keyed anti-backlash models also available. Consult Customer Service.