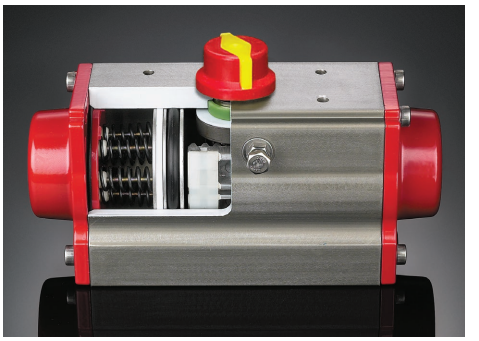
TRIAC®
CONTROLS
A Division of A-T Controls, Inc.

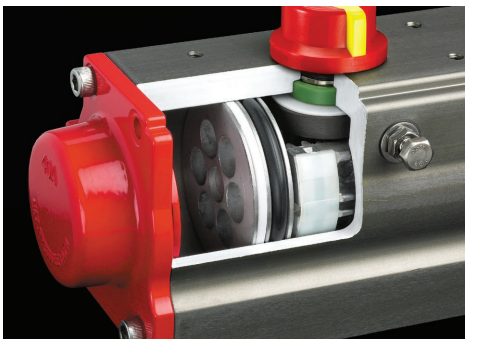
3R

Pneumatic Rotary Actuators and Accessories

FEATURES

TRIAC® pneumatic actuators are designed and manufactured to provide the highest cycle life on the market. A-T Controls can accessorize the 3R pneumatic actuators to accomplish virtually any control requirement. Availability spans 18 models with various mounting dimensions and configurations for appropriate torque compatibility. A-T Controls extensive inventory and engineering capabilities allows for solutions to meet virtually any need. We pride ourselves on exceeding customer expectations. Contact A-T Controls for application assistance.





Hard Anodized Aluminum

- Double Acting and Spring Return
- Dual travel stops[1]
- Torques from 30 to 55,000 In-lbs
- Standard end caps between DA and SR models
- ISO 5211 / DIN 3337 mounting pad dimensions
- Standard hard anodized body for corrosion resistance with options for ENP, PTFE and Epoxy coating to withstand any environment
- NAMUR - VDI/VDE 3845 accessory mounting to accommodate a wide range of limit switches, positioners, solenoids and many other accessories
- Wide base for direct mount to many butterfly valves
- Substantial pinion bearings for high cycle life
- Each unit serialized
- Custom accessory mounting

See options page for details

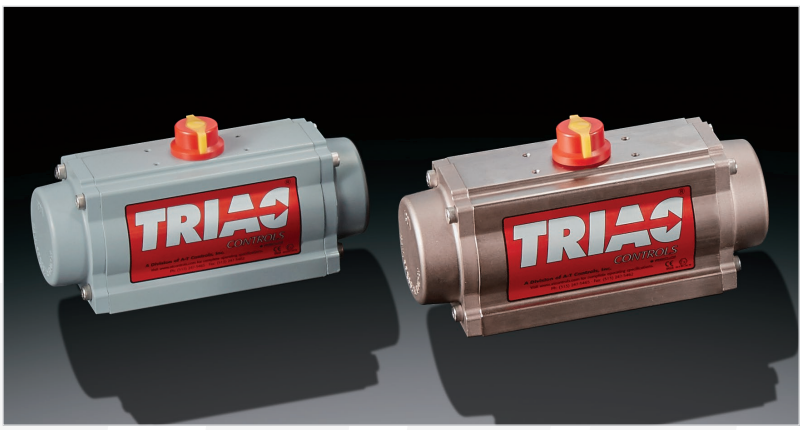
GENERAL TECHNICAL DATA

3R Certifications

3R Pneumatic Rotary Actuators

- Standard working temperature -5°F to 175°F
  - Low temperature option -45°F to 175°F
  - High temperature option 0°F to 300°F
- Maximum working pressure 150 psig
- Operating media - clean dry air, nitrogen, non-corrosive gas or light hydraulic oil.
- Air supply 40 - 150 psi
- Rotation 0±5° to 90±5°
- Standard dual travel stops[1]
- NAMUR - VDI/VDE 3845 accessory mounting
- ISO 5211 Valve mounting (3R10 - 3R3500)
- Custom options available

Nickel Plated and PTFE Infused Options



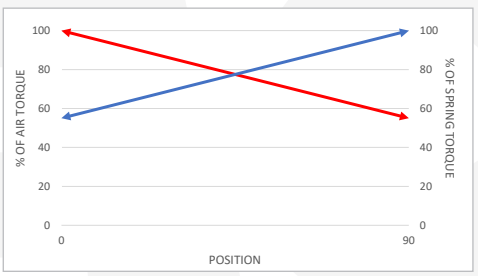
TRIAC 3R10[1] - 3R3300[2] features a dual piston rack and central pinion that allows for a compact design with symmetrical mounting, long cycle life and fast operation.

NOTE:
[1] 3R10 only feature travel stops in the CCW position.
[2] 3R2500 and 3R3500 feature Scotch Yoke Design

Torque Curves

Double Acting

Spring Return

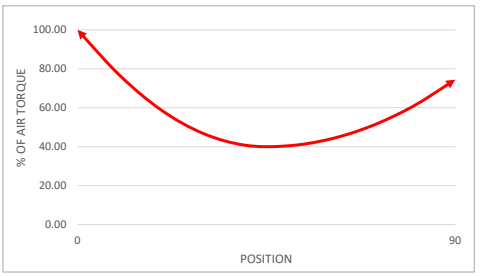


3R2500 & 3R3500 (Scotch Yoke Design)

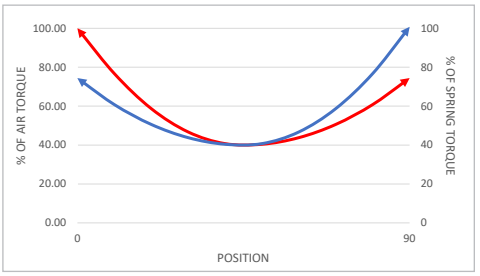
TRIAC 3R2500 & 3R3500 feature a Scotch Yoke design that gives maximum torque at the beginning of the stroke, then decreases through the middle of the stroke and begins to increase as the actuator reaches the open position.

Torque Curves

Double Acting



Spring Return

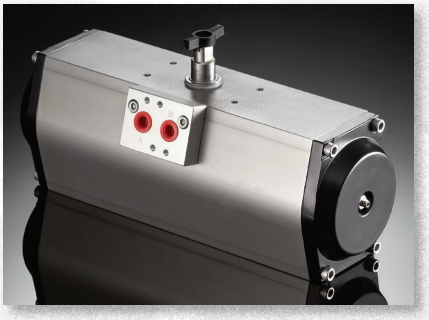


Other Actuator Options

TRIAC
Heavy Duty Actuators

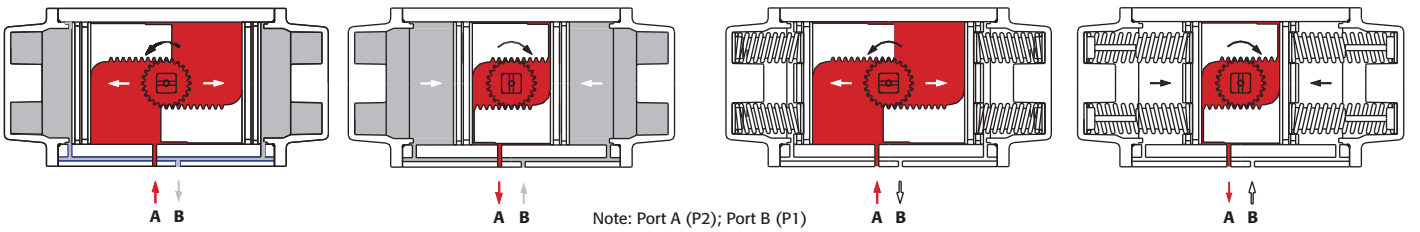
- Double Acting
- Spring Return
- Features stabilizer bar for longer cycle life
- Torques to 1,600,000 in-lbs
- Easy factory mounting
- Symmetric & Canted Yoke

See Stainless Steel Actuator brochure for detailed information.



See 180° Pneumatic Rack & Pinion brochure for details.

OPERATIONAL DETAILS AND FEATURES



Note: Port A (P2); Port B (P1)

Double Acting Operation

CCW
Air is supplied to Port A forcing the pistons away from each other (toward ends), rotating drive pinion counter-clockwise and exhausting air out of Port B.

CW
Air is supplied to Port B forcing the pistons toward each other (toward center), rotating drive pinion clockwise and exhausting air out of Port A.

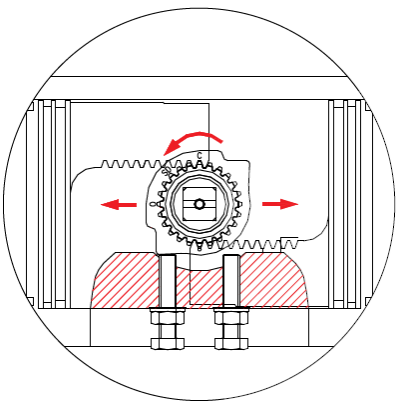
Spring Return Operation

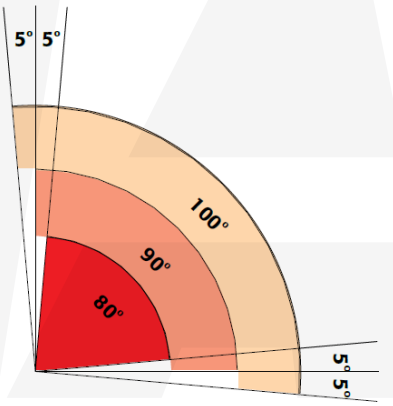
CCW
Air is supplied to Port A forcing the pistons away from each other (toward ends), rotating drive pinion counter-clockwise, compressing springs and exhausting air out of Port B.

FAIL CW
Air failure (loss of pressure) allows compressed springs to force pistons toward each other (toward center), rotating drive pinion clockwise and exhausting air out of Port A.

Dual Travel Stop Adjustment

TRIAC 3R Series features a splined stop collar that provides travel stop adjustments in both the clockwise and counter-clockwise directions. The splined collar ensures minimal hysteresis and repeatable stop positions.





3R RACK & PINION TORQUE INFORMATION

TRIAC

Spring Return Torque *(in*lbs)*

MODEL	SPRINGS PER SIDE	SPRING TORQUE		AIR TORQUE *(per air supply)*							
				40 psi		60 psi		80 psi		100 psi	
		END	BREAK	END	BREAK	END	BREAK	END	BREAK	END	BREAK
3R20SR	2	28	41	52	65	99	112	145	158	192	205
	3	43	62	31	51	78	97	124	144	171	191
	4	57	83	10	37	57	83	104	130	150	177
	5	71	104			36	69	83	116	130	162
	6	85	124			16	55	62	102	109	148
3R40SR	2	46	70	97	121	181	205	264	288	348	372
	3	69	105	62	98	146	182	229	265	313	349
	4	91	139	27	75	111	159	194	242	278	326
	5	114	174			76	136	160	220	243	303
	6	137	209			41	113	125	197	208	280
3R80SR	2	106	155	206	255	387	435	567	616	748	796
	3	159	232	129	202	309	382	490	563	670	743
	4	212	309	52	149	232	329	412	510	593	690
	5	265	387			155	277	335	457	516	637
	6	318	464			77	224	258	404	438	584
3R130SR	2	156	231	295	369	558	632	821	895	1,084	1,158
	3	235	346	180	291	443	554	706	817	968	1,080
	4	313	461	65	213	327	476	590	739	853	1,002
	5	391	576			212	398	475	661	738	923
	6	469	692			97	320	360	582	623	845
3R200SR	2	212	330	431	548	811	929	1,192	1,309	1,572	1,690
	3	319	495	266	442	646	823	1,027	1,203	1,407	1,584
	4	425	660	101	336	481	716	862	1,097	1,242	1,477
	5	531	825			316	610	697	991	1,077	1,371
	6	637	990			151	504	532	884	912	1,265
3R300SR	2	351	526	660	835	1,253	1,428	1,847	2,021	2,440	2,614
	3	527	789	397	659	991	1,252	1,584	1,846	2,177	2,439
	4	703	1,052	134	484	728	1,077	1,321	1,670	1,914	2,263
	5	878	1,315			465	901	1,058	1,494	1,651	2,087
	6	1,054	1,578			202	726	795	1,319	1,388	1,912
3R500SR	2	576	865	1,164	1,454	2,178	2,468	3,193	3,483	4,207	4,497
	3	863	1,298	731	1,166	1,746	2,180	2,760	3,195	3,775	4,209
	4	1,151	1,730	299	878	1,313	1,892	2,328	2,907	3,342	3,922
	5	1,439	2,163			881	1,605	1,895	2,619	2,910	3,634
	6	1,727	2,596			448	1,317	1,463	2,331	2,477	3,346
3R700SR	2	738	1,108	1,454	1,824	2,735	3,105	4,016	4,386	5,297	5,667
	3	1,107	1,663	900	1,455	2,181	2,736	3,462	4,017	4,743	5,298
	4	1,477	2,217	345	1,086	1,626	2,367	2,908	3,648	4,189	4,929
	5	1,846	2,771			1,072	1,998	2,353	3,279	3,634	4,560
	6	2,215	3,325			518	1,628	1,799	2,910	3,080	4,191
3R850SR	2	937	1,398	1,694	2,155	3,240	3,701	4,786	5,247	6,332	6,793
	3	1,406	2,096	995	1,686	2,541	3,232	4,087	4,778	5,633	6,324
	4	1,874	2,795	297	1,217	1,843	2,763	3,389	4,309	4,934	5,855
	5	2,343	3,494			1,144	2,295	2,690	3,841	4,236	5,387
	6	2,812	4,193			445	1,826	1,991	3,372	3,537	4,918
3R1000SR	2	1,064	1,597	2,102	2,635	3,952	4,484	5,801	6,334	7,650	8,183
	3	1,596	2,395	1,304	2,103	3,153	3,952	5,003	5,802	6,852	7,651
	4	2,128	3,193	505	1,571	2,355	3,420	4,204	5,269	6,054	7,119
	5	2,660	3,992			1,557	2,888	3,406	4,737	5,255	6,587
	6	3,192	4,790			758	2,356	2,608	4,205	4,457	6,055
3R1200SR	2	1,342	2,076	2,907	3,641	5,398	6,132	7,890	8,624	10,381	11,115
	3	2,014	3,114	1,869	2,969	4,360	5,461	6,852	7,952	9,343	10,444
	4	2,685	4,152	831	2,298	3,322	4,790	5,814	7,281	8,305	9,773
	5	3,356	5,190			2,284	4,119	4,776	6,610	7,267	9,102
	6	4,027	6,228			1,246	3,447	3,738	5,939	6,229	8,430
3R1750SR	2	1,846	2,548	3,539	4,241	6,582	7,285	9,626	10,328	12,670	13,372
	3	2,769	3,823	2,265	3,318	5,308	6,362	8,352	9,405	11,395	12,449
	4	3,692	5,097	990	2,395	4,034	5,439	7,078	8,482	10,121	11,526
	5	4,615	6,371			2,760	4,516	5,803	7,559	8,847	10,603
	6	5,538	7,645			1,485	3,593	4,529	6,636	7,573	9,680
3R2400SR	2	2,755	3,719	5,225	6,190	9,698	10,662	14,170	15,134	18,642	19,607
	3	4,132	5,579	3,366	4,813	7,838	9,285	12,310	13,757	16,783	18,229
	4	5,509	7,438	1,506	3,435	5,979	7,908	10,451	12,380	14,923	16,852
	5	6,886	9,298			4,119	6,530	8,591	11,003	13,063	15,475
	6	8,264	11,157			2,259	5,153	6,732	9,625	11,204	14,098
3R2700SR	2	3,756	5,278	8,307	9,829	15,099	16,621	21,891	23,413	28,683	30,205
	3	5,634	7,917	5,668	7,951	12,460	14,743	19,252	21,535	26,044	28,327
	4	7,512	10,556	3,029	6,073	9,821	12,865	16,613	19,657	23,405	26,449
	5	9,390	13,195			7,182	10,987	13,974	17,779	20,766	24,571
	6	11,268	15,834			4,543	9,109	11,335	15,901	18,127	22,693
3R3300SR	2	5,173	7,516	11,118	13,462	20,436	22,779	29,753	32,096	39,070	41,413
	3	7,759	11,274	7,360	10,876	16,677	20,193	25,995	29,510	35,312	38,827
	4	10,345	15,032	3,602	8,289	12,919	17,606	22,237	26,924	31,554	36,241
	5	12,931	18,790			9,161	15,020	18,479	24,337	27,796	33,655
	6	15,518	22,548			5,403	12,434	14,721	21,751	24,038	31,068

3R RACK & PINION TORQUE INFORMATION

3R2500 & 3R3500 Spring Return Torque *(in*lbs)*

MODEL	SPRING DIRECTION	SUPPLY PRESSURE	AIR BREAK	MIN	AIR END	SPRING BREAK	MIN	SPRING END
3R2500SR	CW	60 psi	9,854	4,000	5,612	6,000	2,500	3,480
		80 psi	12,258	4,750	6,403	9,080	3,950	5,520
		100 psi	14,728	5,978	8,005	11,349	5,133	7,495
3R2500SO	CCW	60 psi	7,522	4,160	6,000	6,240	2,330	2,760
		80 psi	9,500	5,110	6,432	7,800	3,600	4,200
3R3500SR	CW	60 psi	19,700	8,000	11,200	12,000	5,000	6,900
		80 psi	24,500	9,500	12,800	18,100	7,900	11,000
		100 psi	29,450	11,956	16,010	22,698	10,266	14,990
3R3500SO	CCW	60 psi	15,000	8,200	12,000	12,400	4,600	5,410
		80 psi	19,000	10,200	12,800	15,600	7,200	8,400

Double Acting Torque *(in*lbs)*

3R MODEL	AIR TORQUE *(per air supply)*				
	40 psi	60 psi	80 psi	100 psi	120 psi
3R10DA	30	45	60	75	90
3R20DA	93	140	187	233	280
3R40DA	167	250	334	417	501
3R80DA	361	541	722	902	1,083
3R130DA	526	789	1,051	1,314	1,577
3R200DA	761	1,141	1,522	1,902	2,283
3R300DA	1,186	1,779	2,372	2,966	3,559
3R500DA	2,029	3,044	4,058	5,073	6,087
3R700DA	2,562	3,843	5,124	6,406	7,687
3R850DA	3,092	4,638	6,184	7,730	9,276
3R1000DA	3,699	5,548	7,398	9,247	11,097
3R1200DA	4,983	7,474	9,966	12,457	14,949
3R1750DA	6,087	9,131	12,174	15,218	18,262
3R2400DA	8,945	13,417	17,889	22,361	26,834
3R2700DA	13,584	20,377	27,169	33,961	40,753
3R3300DA	18,634	27,952	37,269	46,586	55,903

NOTE:
Torques shown are for 3R Series (ISO-5211) and 3K Series (Keystone Direct Mount).

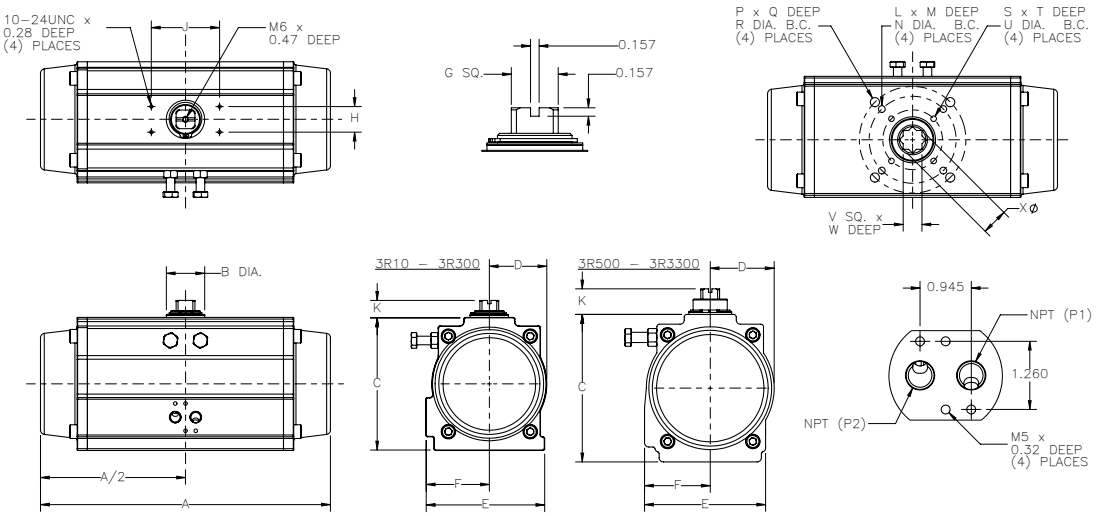
Torques are actual. Please be sure to include appropriate safety factors for all service condition variables when sizing.

3-way (primary/secondary) assemblies should use a 35% safety factor. Call factory for assistance.

3R2500 & 3R3500 Double Acting Torque *(in*lbs)*

MODEL	SUPPLY PRESSURE	0°	MIN	90°
3R2500DA	60 psi	13,334	6,667	11,610
	80 psi	17,778	8,890	15,483
	100 psi	22,223	11,110	19,350
3R3500DA	60 psi	26,650	13,330	23,200
	80 psi	35,550	17,750	30,960
	100 psi	44,440	22,200	38,700

3R RACK & PINION DIMENSIONAL INFORMATION



Model	3R10	3R20	3R40	3R80	3R130	3R200	3R300	3R500	3R700	3R850	3R1000	3R1200	3R1750	3R2400	3R2700	3R3300
A	4.57	6.50	7.60	9.29	11.02	11.50	13.39	15.35	16.89	19.37	19.31	22.36	23.54	24.80	28.27	30.47
B dia.	0.79	0.87	1.06	1.06	1.34	1.34	1.77	1.97	1.97	1.97	1.97	1.97	2.84	2.84	2.84	2.84
C	1.91	2.84	3.47	4.30	4.61	5.28	6.14	6.81	7.36	7.81	8.46	9.06	10.08	11.46	12.99	13.84
D	0.83	1.18	1.42	1.81	1.97	2.26	2.66	2.95	3.19	3.43	3.74	4.06	4.45	5.12	5.79	6.38
E	1.93	2.66	3.35	4.18	4.27	4.57	5.49	5.59	5.94	6.34	7.01	7.44	8.27	9.65	10.75	12.32
F	1.10	1.63	1.85	2.24	2.30	2.52	2.93	3.03	3.19	3.43	3.74	4.06	4.45	5.12	5.79	6.38
NPT	1/8"	1/8"	1/8"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
ACCESSORY MOUNTING DIMENSIONS																
G sq.	0.354	0.394	0.394	0.394	0.551	0.551	0.866	0.866	0.866	0.866	0.866	1.260	1.260	1.260	1.260	1.260
H	0.984	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181
J	1.969	3.150	3.150	3.150	3.150	3.150	3.150	5.118	5.118	5.118	5.118	5.118	5.118	5.118	5.118	5.118
K	0.787	0.787	0.787	0.787	0.787	0.787	0.787	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181
VALVE MOUNTING DIMENSIONS																
ISO 5211	F03	F04	F05/F07	F05/F07/F10	F07/F10	F07/F10	F07/F10/F12	F10/F12	F10/F12	F10/F12	F12	F14	F14	F16	F16	F16
U dia.	1.417	1.654	1.969	1.969	N/A	N/A	2.756	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N dia.	N/A	N/A	2.756	2.756	2.756	2.756	4.016	4.016	4.016	4.016	N/A	N/A	N/A	N/A	N/A	N/A
R dia.	N/A	N/A	N/A	4.016	4.016	4.016	4.921	4.921	4.921	4.921	4.921	5.512	5.512	6.496	6.496	6.496
S	10-24	10-24	1/4-20	1/4-20	N/A	N/A	5/16-18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
L	N/A	N/A	5/16-18	5/16-18	5/16-18	5/16-18	3/8-16	3/8-16	3/8-16	3/8-16	N/A	N/A	N/A	N/A	N/A	N/A
P	N/A	N/A	N/A	3/8-16	3/8-16	3/8-16	1/2-13	1/2-13	1/2-13	1/2-13	1/2-13	5/8-11	5/8-11	3/4-10	3/4-10	3/4-10
T	0.24	0.32	0.39	0.39	N/A	N/A	0.472	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	N/A	N/A	0.47	0.47	0.47	0.47	0.63	0.63	0.63	0.63	N/A	N/A	N/A	N/A	N/A	N/A
Q	N/A	N/A	N/A	0.63	0.63	0.63	0.79	0.79	0.79	0.79	0.79	0.87	0.87	0.98	0.98	0.98
V sq.	0.354	0.433	0.551	0.748	0.748	0.748	0.866	1.063	1.063	1.063	1.417	1.417	1.417	1.811	1.811	1.811
W	0.39	0.63	0.71	0.75	0.83	0.83	1.02	1.18	1.18	1.18	1.90	1.90	1.90	2.00	2.36	2.36
X	0.460	0.612	0.779	1.058	1.058	1.058	1.225	1.503	1.503	1.503	2.004	2.004	2.004	2.561	2.561	2.561
WEIGHT (lbs.)																
DA	2.2	3.0	4.8	8.0	10.5	13.5	21.9	29.6	35.3	44.6	54.1	72.4	88.4	120.6	160.9	211.9
SR	N/A	3.2	5.1	8.8	11.8	15.0	24.5	33.8	39.7	51.5	61.6	82.7	105.6	133.5	201.7	262.7
VOLUME (cubic inches per 90°)																
CW	3	10.4	17.1	40.3	60.4	79.9	130.0	200.8	256.9	341.1	392.4	554.1	721.3	984.3	1468.2	1938.7
CCW	3	7.9	14.0	28.7	42.1	61.6	98.2	162.3	206.9	228.8	283.1	400.9	487.6	717.0	1064.9	1479.8
CYCLE TIMES (seconds per 90°)																
DA	0.3	0.5	0.6	1.0	1.2	1.5	2.0	2.5	2.9	3.3	3.5	4.2	5.0	7.0	10.0	14.0
SR	N/A	0.5	0.6	1.0	1.2	1.5	2.0	2.5	2.9	3.3	3.5	4.2	5.0	7.0	10.0	14.0

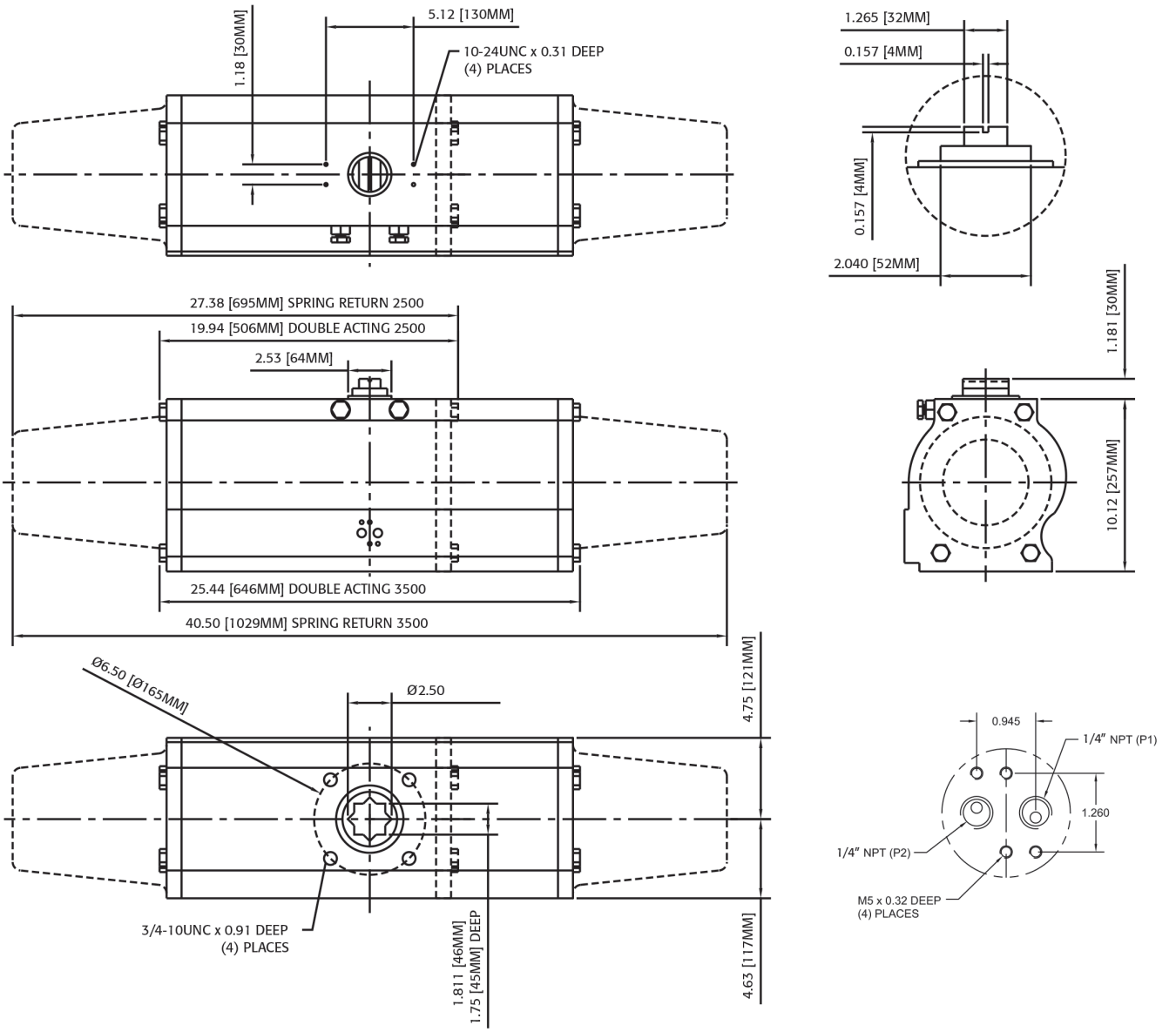
3R10 has travel stops located in the End Caps for travel adjustment in one direction.

Direct Acting:
Pressure at port P1 will result in a clockwise rotation
Pressure at port P2 will result in a counter-clockwise rotation
Reverse Acting:
Pressure at port P1 will result in a counter-clockwise rotation
Pressure at port P2 will result in a clockwise rotation

$$\text{Air Consumption (scf per 90°)} = \frac{\text{Volume (in}^3\text{)}}{1{,}728} \times \frac{\text{Supply Pressure (psi)} + 14.7}{14.7}$$

NOTES: Accessory mounting holes are not intended for Manual Gear Overrides or Stop Blocks. Cycle times are under no load conditions. Air line size, air capacity, and valve torque characteristics affect these cycle times. Faster or slower cycle times can be accomplished using special control components or modifying inlet port.

3R2500 & 3R3500
DIMENSIONAL INFORMATION



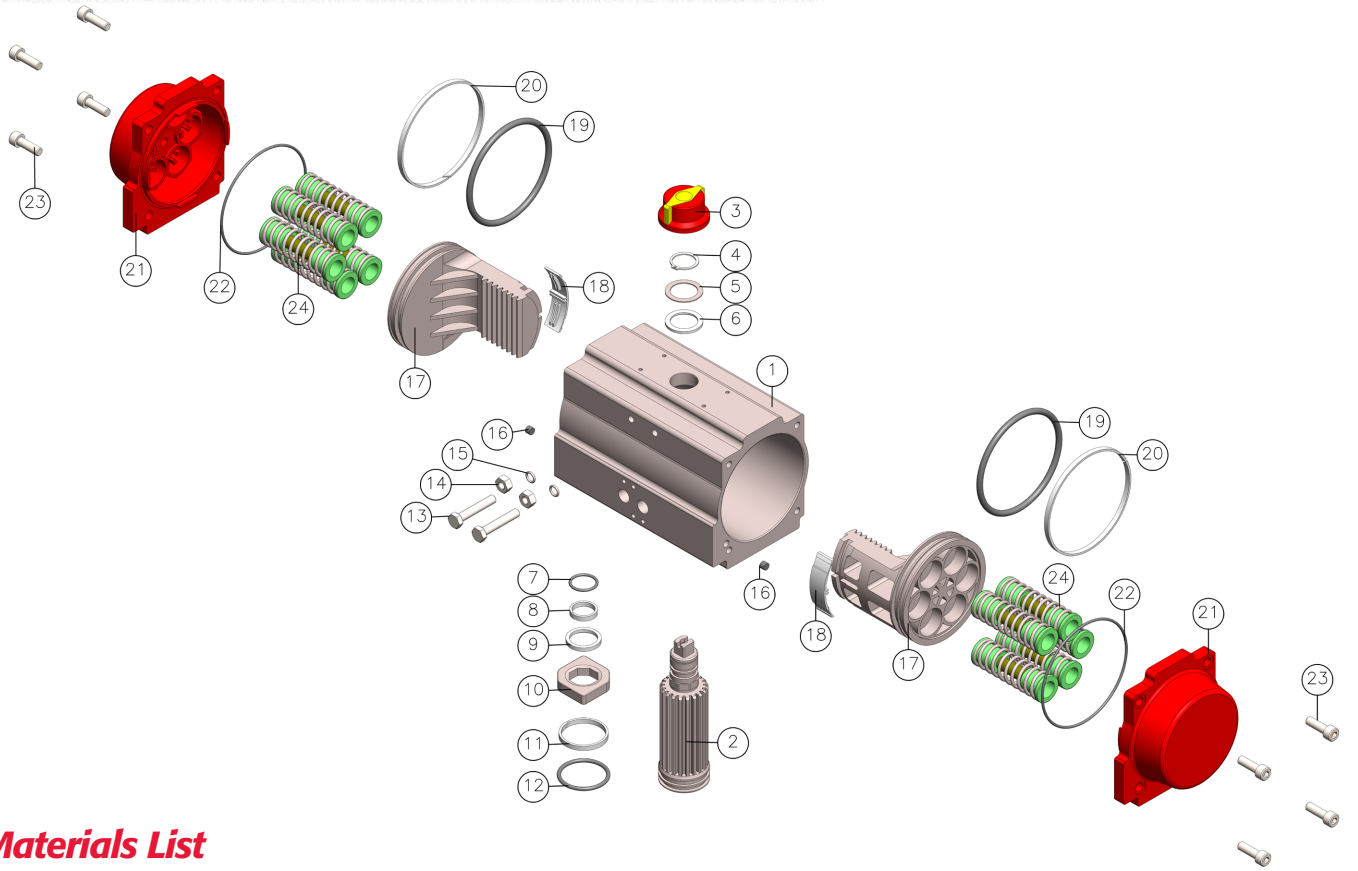
ACTUATORS SHOWN IN THE FULL CLOCKWISE POSITION (CW) WHEN VIEWED FROM THE ACCESSORY SIDE.

MODEL	WEIGHT (lbs)		VOLUME (CU. IN. PER 90°)		CYCLE TIMES (SEC. PER 90°)	
	DA	SR	CW	CCW	CW	CCW
3R2500	98	137	525	310	5	5
3R3500	125	195	650	585	9	9

$$\text{Air Consumption (scf per 90°)} = \frac{\text{Volume (in\^3)}}{1{,}728} \times \frac{\text{Supply Pressure (psi)} + 14.7}{14.7}$$

NOTES: Accessory mounting holes are not intended for Manual Gear Overrides or Stop Blocks. Cycle times are under no load conditions. Air line size, air capacity, and valve torque characteristics affect these cycle times. Faster or slower cycle times can be accomplished using special control components or modifying inlet port.

3R RACK & PINION EXPLODED VIEW



Materials List

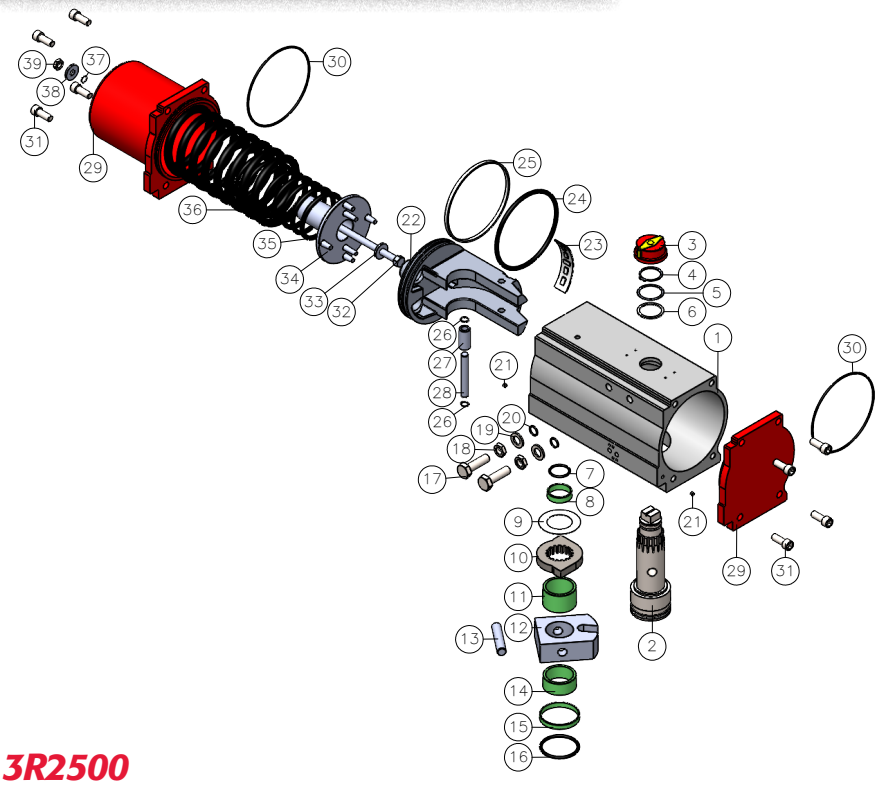
No.	Description	Qty.	Standard Material	ENP Coated	PTFE (Infused/Coated)	Options	Repair Kit
1	CYLINDER BODY	1	Hard Anodized Aluminum (AL6005-T5)	Electroless Nickel Plated Aluminum	Hard Anodized & PTFE Coated Aluminum		
2	PINION	1	Zinc/Chromate Plated Carbon Steel	316 Stainless Steel	316 Stainless Steel		
3	POSITION INDICATOR	1	Acrylonitrile Butadiene Styrene (ABS)	Acrylonitrile Butadiene Styrene (ABS)	Acrylonitrile Butadiene Styrene (ABS)		
4	SNAP RING	1	Electroless Nickel Plated Steel	Electroless Nickel Plated Steel	Electroless Nickel Plated Steel		
5	PINION SST WASHER	1	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		✔
6	PINION WASHER	1	Polyoxymethylene (POM)	Polyoxymethylene (POM)	Polyoxymethylene (POM)		✔
7	TOP PINION O-RING	1	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
8	TOP PINION BUSHING-A	1	Nylon (A66)	Nylon (A66)	Nylon (A66)		✔
9	TOP PINION BUSHING-B	1	Nylon (A66)	Nylon (A66)	Nylon (A66)		✔
10	TRAVEL STOP CAM	1	Nickel Phosphorus Coated 45# Alloy Steel	Nickel Phosphorus Coated 45# Alloy Steel	Nickel Phosphorus Coated 45# Alloy Steel		
11	BOTTOM PINION BUSHING	1	Nylon (A66)	Nylon (A66)	Nylon (A66)		✔
12	BOTTOM PINION O-RING	1	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
13	TRAVEL STOP BOLT	2	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		
14	TRAVEL STOP NUT	2	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		
15	TRAVEL STOP O-RING	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)		✔
16	HOLE SEALANT	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
17	PISTON	2	Anodic Oxidation Film Die Cast Aluminum	Anodic Oxidation Film Die Cast Aluminum	Anodic Oxidation Film Die Cast Aluminum		
18	GUIDE PLATE	2	Nylon (A66)	Nylon (A66)	Nylon (A66)		✔
19	PISTON O-RING	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
20	PISTON GUIDE BAND	2	Nylon (A66)	Nylon (A66)	Nylon (A66)		✔
21	END CAP	2	Epoxy Coated Die Cast Aluminum	Electroless Nickel Plated Aluminum	PTFE Coated Aluminum		
22	END CAP O-RING	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
23	END CAP BOLT	2	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		
24	SPRING CARTRIDGE	10*	Epoxy Coated Spring Steel	Epoxy Coated Spring Steel	Epoxy Coated Spring Steel		

*Spring Qty. can range from 1-12.

Repair Kit		
Nitrile Buna (NBR)	3RKB (Actuator Size)	-5°F ~ +175°F
Viton® (FKM)	3RKV (Actuator Size)	0°F ~ +300°F
Low Temp Silicone	3RKL (Actuator Size)	-45°F ~ +175°F

Example: 3RKB0130 = Nitrile Buna Repair Kit for 3R130

3R2500
EXPLODED VIEW

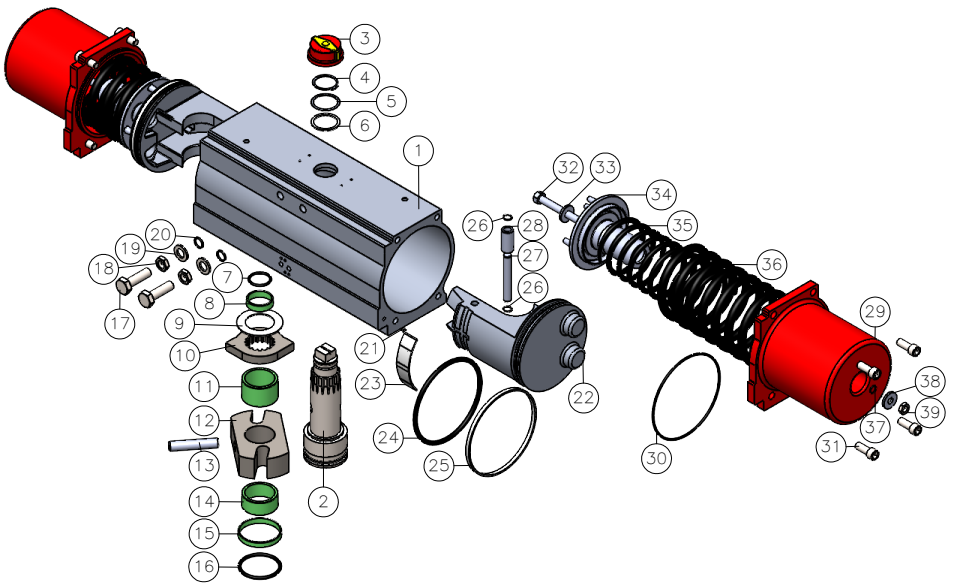


Materials List | 3R2500

No.	Description	Qty.	Standard Material	ENP Coated	PTFE (Infused/Coated)	Options	Repair Kit
1	ACTUATOR BODY	1	Hard Anodized Aluminum A6NO1ST5	Electroless Nickel Plated Aluminum	Hard Anodized & PTFE Coated Aluminum		
2	DRIVE SHAFT	1	Zinc/Chromate Plating S45C-D	Zinc/Chromate Plating S45C-D	Zinc/Chromate Plating S45C-D		
3	POSITION INDICATOR	1	Polyethylene	Polyethylene	Polyethylene		
4	DRIVE SHAFT SNAP RING	1	Zinc Plated SK5	Zinc Plated SK5	Zinc Plated SK5		✔
5	SUPPORT WASHER	1	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		✔
6	SUPPORT BUSHING	1	Polyoxymethylene (POM)	Polyoxymethylene (POM)	Polyoxymethylene (POM)		✔
7	DRIVE SHAFT UPPER O-RING	1	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
8	DRIVE SHAFT UPPER BUSHING	1	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)		✔
9	STOP CAM SPACER	1	PTFE	PTFE	PTFE		✔
10	TRAVEL STOP CAM	1	SCM21 Nickel Phosphorus Coated	SCM21 Nickel Phosphorus Coated	SCM21 Nickel Phosphorus Coated		
11	TRAVEL STOP CAM SUPPORT BUSHING	1	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)		✔
12	YOKE	1	Nitriding S45C-D	Nitriding S45C-D	Nitriding S45C-D		
13	YOKE PIN	1	S45C-D	S45C-D	S45C-D		
14	YOKE SUPPORT BUSHING	1	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)		
15	DRIVE SHAFT LOWER BUSHING	1	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)		✔
16	DRIVE SHAFT LOWER O-RING	1	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
17	TRAVEL STOP BOLT	2	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		
18	TRAVEL STOP NUT	2	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		
19	TRAVEL STOP WASHER	2	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		✔
20	TRAVEL STOP O-RING	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
21	HOLE SEAL	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	
22	PISTON	1	AC2B-F	AC2B-F	AC2B-F		
23	PISTON GUIDE PLATE	1	NYLON6	NYLON6	NYLON6		✔
24	PISTON O-RING	1	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	*Viton® (FKM) & Silicone*	✔
25	PISTON GUIDE RING	1	PTFE	PTFE	PTFE		✔
26	PISTON PIN SNAP RING	2	Zinc Plated Steel	Zinc Plated Steel	Zinc Plated Steel		
27	PISTON PIN	1	Nitriding S45C-D	Nitriding S45C-D	Nitriding S45C-D		
28	PISTON ROLLER	1	Nitriding Bearing Steel	Nitriding Bearing Steel	Nitriding Bearing Steel		
29	END CAP	2	Epoxy Coated AC2B-F	Electroless Nickel Plated Aluminum	PTFE Coated Aluminum		
30	END CAP O-RING	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	
31	END CAP BOLT	8	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		
32	PRE-TENSIONING BOLT	1	Electroless Nickel Plated SCM435	Electroless Nickel Plated SCM435	Electroless Nickel Plated SCM435		
33	SPRING GUIDE WASHER	1	Electroless Nickel Plated SPCC	Electroless Nickel Plated SPCC	Electroless Nickel Plated SPCC		
34	SPRING GUIDE	1	AC2B-F	AC2B-F	AC2B-F		
35	INNER SPRING	*	SUP 10	SUP 10	SUP 10		
36	OUTER SPRING	*	SUP 10	SUP 10	SUP 10		
37	PRE-TENSIONING O-RING	1	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
38	PRE-TENSIONING WASHER	1	Electroless Nickel Plated SPCC	Electroless Nickel Plated SPCC	Electroless Nickel Plated SPCC		
39	PRE-TENSIONING NUT	1	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		

*Varies by size and pressure rating.

3R3500
EXPLODED VIEW



Materials List | 3R3500

No.	Description	Qty.	Standard Material	ENP Coated	PTFE (Infused/Coated)	Options	Repair Kit
1	ACTUATOR BODY	1	Hard Anodized Aluminum A6NO1ST5	Electroless Nickel Plated Aluminum	Hard Anodized & PTFE Coated Aluminum		
2	DRIVE SHAFT	1	Zinc/Chromate Plating S45C-D	Zinc/Chromate Plating S45C-D	Zinc/Chromate Plating S45C-D		
3	POSITION INDICATOR	1	Polyethylene	Polyethylene	Polyethylene		
4	DRIVE SHAFT SNAP RING	1	Zinc Plated SK5	Zinc Plated SK5	Zinc Plated SK5		✔
5	SUPPORT WASHER	1	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		✔
6	SUPPORT BUSHING	1	Polyoxymethylene (POM)	Polyoxymethylene (POM)	Polyoxymethylene (POM)		✔
7	DRIVE SHAFT UPPER O-RING	1	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
8	DRIVE SHAFT UPPER BUSHING	1	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)		✔
9	STOP CAM SPACER	1	PTFE	PTFE	PTFE		✔
10	TRAVEL STOP CAM	1	SCM21 Nickel Phosphorus Coated	SCM21 Nickel Phosphorus Coated	SCM21 Nickel Phosphorus Coated		
11	TRAVEL STOP CAM SUPPORT BUSHING	1	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)		✔
12	YOKE	1	Nitriding S45C-D	Nitriding S45C-D	Nitriding S45C-D		
13	YOKE PIN	1	S45C-D	S45C-D	S45C-D		
14	YOKE SUPPORT BUSHING	1	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)		
15	DRIVE SHAFT LOWER BUSHING	1	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)	Nylon 4/6 (TP-601)		✔
16	DRIVE SHAFT LOWER O-RING	1	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
17	TRAVEL STOP BOLT	2	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		
18	TRAVEL STOP NUT	2	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		
19	TRAVEL STOP WASHER	2	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		✔
20	TRAVEL STOP O-RING	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
21	HOLE SEAL	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	
22	PISTON	2	AC2B-F	AC2B-F	AC2B-F		
23	PISTON GUIDE PLATE	2	NYLON6	NYLON6	NYLON6		✔
24	PISTON O-RING	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	*Viton® (FKM) & Silicone*	✔
25	PISTON GUIDE RING	2	PTFE	PTFE	PTFE		✔
26	PISTON PIN SNAP RING	4	Zinc Plated Steel	Zinc Plated Steel	Zinc Plated Steel		
27	PISTON PIN	2	Nitriding S45C-D	Nitriding S45C-D	Nitriding S45C-D		
28	PISTON ROLLER	2	Nitriding Bearing Steel	Nitriding Bearing Steel	Nitriding Bearing Steel		
29	END CAP	2	Epoxy Coated AC2B-F	Electroless Nickel Plated Aluminum	PTFE Coated Aluminum		
30	END CAP O-RING	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	
31	END CAP BOLT	8	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		
32	PRE-TENSIONING BOLT	2	Electroless Nickel Plated SCM435	Electroless Nickel Plated SCM435	Electroless Nickel Plated SCM435		
33	SPRING GUIDE WASHER	2	Electroless Nickel Plated SPCC	Electroless Nickel Plated SPCC	Electroless Nickel Plated SPCC		
34	SPRING GUIDE	2	AC2B-F	AC2B-F	AC2B-F		
35	INNER SPRING	*	SUP 10	SUP 10	SUP 10		
36	OUTER SPRING	*	SUP 10	SUP 10	SUP 10		
37	PRE-TENSIONING O-RING	2	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Nitrile Buna (NBR)	Viton® (FKM) & Silicone	✔
38	PRE-TENSIONING WASHER	2	Electroless Nickel Plated SPCC	Electroless Nickel Plated SPCC	Electroless Nickel Plated SPCC		
39	PRE-TENSIONING NUT	2	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel		

*Varies by size and pressure rating.

Coatings

Hard Anodized (Standard)

TRIAC® 3R Rack & Pinion Actuators are designed with corrosion resistance for industrial applications. 3R Series actuators feature an internally and externally hard anodized body that results in a surface with lower coefficient of friction and minimizes wear while maintaining high cycle life.

COMPONENTS:

- Body - Hard Anodized Aluminum
- End Caps - Epoxy Coated Aluminum
- Pinion - Zinc/Chromate plated Carbon Steel
- Fasteners - 304 Stainless Steel

WHERE TO USE:

- General Use
- Industrial Applications

Electroless Nickel Plated (ENP)

TRIAC® Electroless Nickel Plated 3R Actuators are designed for excellent corrosion resistance. Featuring the integrated benefits of the electroless plating process to create a uniform nickel phosphorus deposit, 3R ENP Actuators are resistant to acids/ acidic environments, and low concentrations of basic solutions. This makes the 3R Series ENP coated actuator an excellent choice for a balance of corrosion resistance and high cycle life.

COMPONENTS:

- Body - Electroless Nickel Plated Aluminum
- End Caps - Electroless Nickel Plated Aluminum
- Pinion - 316 Stainless Steel
  - 3R2500 & 3R3500 are S45C-D with Zinc/Chromate Plating
- Fasteners - 304 Stainless Steel

WHERE TO USE:

- In services with:
  - Oxygen
  - Sodium Hydroxide (Caustic Soda)
  - Potassium Hydroxide (Caustic Potash)
  - Acid Mines

TESTS:

- Caustic Washdown with 2% NaOH @ 150˚F

PTFE (Infused/Coated)

TRIAC® PTFE (Infused/ Coated) Actuators are designed for superior corrosion resistance. Featuring an internally and externally hard anodized body with PTFE and PTFE coated endcaps, 3R PTFE Actuators are resistant to acids and low concentrations of basic solutions.

COMPONENTS:

- Body - Hard Anodized & PTFE Coated Aluminum
- End Caps - PTFE Coated Aluminum
- Pinion - 316 Stainless Steel
  - 3R2500 & 3R3500 are S45C-D with Zinc/Chromate Plating
- Fasteners - 304 Stainless Steel

WHERE TO USE:

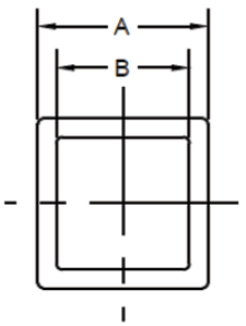
- In services with:
  - Sodium Hydroxide (Caustic Soda)
  - Potassium Hydroxide (Caustic Potash)

TESTS:

- ASTM B117 Salt Fog Spray for 1,000 hours.
- Caustic Washdown with 2% NaOH @ 150˚F

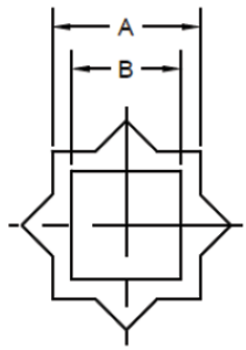
Inserts for use with 3R Series Actuators

Square Insert



SQUARE INSERT	A		B	
	in	mm	in	mm
C13706	0.551	14	0.354	9
C14352	0.669	17	0.551	14
C14700	0.866	22	0.433	11
C11251	0.866	22	0.669	17
ATE22T19	0.866	22	0.748	19
C17394	1.063	27	0.433	11
C17012	1.063	27	0.551	14
C15186	1.063	27	0.748	19
C17291	1.063	27	0.866	22
C17011	1.417	36	0.669	17
C17013	1.417	36	0.748	19
C17014	1.417	36	0.866	22
C13116	1.417	36	1.063	27

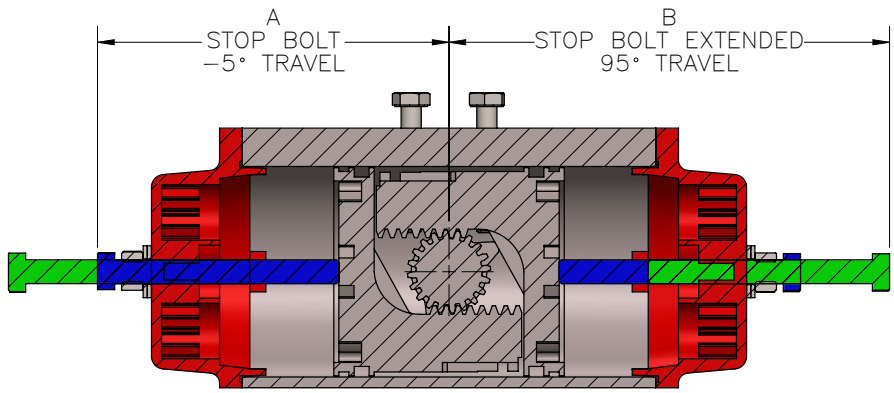
Star Insert



STAR INSERT	A		B	
	in	mm	in	mm
ATD11T09	0.433	11	0.354	9
ATD14T09	0.551	14	0.354	9
ATD14T11	0.551	14	0.433	11
ATD17T11	0.669	17	0.433	11
ATD19T09	0.748	19	0.354	9
ATD19T11	0.748	19	0.433	11
ATD19T14	0.748	19	0.551	14
ATD19T17	0.748	19	0.669	17
ATD22T14	0.866	22	0.551	14
ATD27T17	1.063	27	0.669	17
ATD27T22	1.063	27	0.866	22

Extended Travel Stops

Extended travel stops allows for 100% adjustment between -5° and 95° in CCW direction[3].



NOTE:
[3] 100% adjustment would be in the CW direction for reverse acting configurations.

PART #	MODEL #	A	B
3R20XX-E	3R20	4.36	5.40
3R40XX-E	3R40	4.75	5.81
3R80XX-E	3R80	5.49	6.88
3R130XX-E	3R130	6.71	8.47
3R200XX-E	3R200	7.06	8.68
3R300XX-E	3R300	8.27	9.77
3R500XX-E	3R500	9.22	11.80
3R700XX-E	3R700	9.73	12.39
3R850XX-E	3R850	11.25	14.44
3R1000XX-E	3R1000	11.30	14.14
3R1200XX-E	3R1200	12.83	16.50
3R1750XX-E	3R1750	13.61	17.11
3R2400XX-E	3R2400	15.29	19.18
3R2700XX-E	3R2700	16.42	21.26
3R3300XX-E	3R3300	17.87	23.78

Solenoid Valves

TVCS-X411-4N
Direct Mount Solenoids
All Accessory Options Available

- Direct mount TVC series
- Nipple mount available
- Weatherproof/Explosion proof construction
- Intrinsically safe coil available
- Various voltages - AC or DC
- Quick exhaust modification
- 2 or 3 position controls
- Exhaust speed controls

APL Limit Switches

- Aluminum or Stainless Steel housing
- Weatherproof/Explosion proof construction
- Dome indicator
- Easy-Set cams
- Captive bolts
- Many switch options
- AS-I systems
- Can be mounted on manual valves

See brochure for details & options.

APL-310N
CSA Approved,
Type 4X

APL-510N
CSA Approved
Class I, Div 1 & 2, Groups B, C, D

APL-210N
CSA Approved, Type 4X

APL-910N
Stainless Steel
Type 4X, IP 67

Positioners

PPR, EPR &
SS "Smart" Series

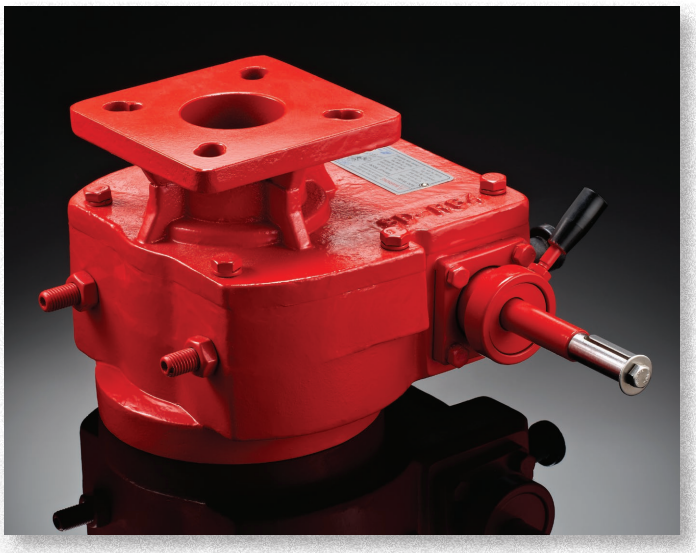
TRIAC® PPR (3-15 PSI control) and EPR (4-20 mA control) are rotary type pneumatic positioners with advanced control devices which provide unparalleled stability in difficult environments.

SS "Smart" Series offers smart performance with innovative and ever-long drive even under harsh weather environments.

- SS2 Rotary Smart Digital Valve Positioner
- SS3 Flame Proof Digital Valve Positioner
- SS5 Fail-Freeze Digital ValvePositioner

Other position options available - Consult factory for more information.

Declutchable Gear Overrides



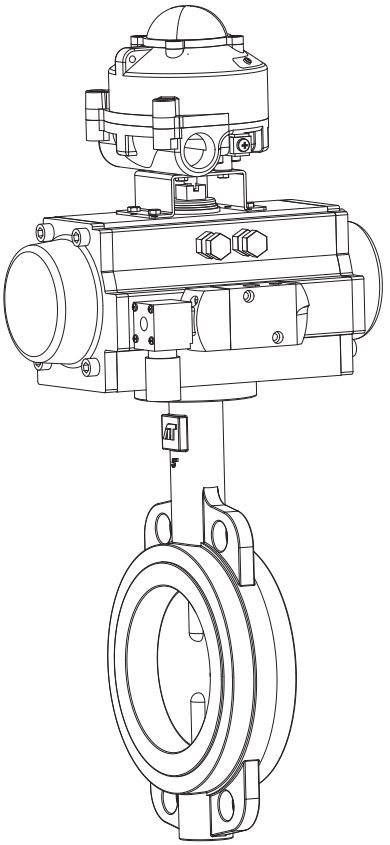
3R and 3K DGO SERIES

The Declutchable Gear Override "sandwich mounts" between a pneumatic quarter-turn actuator and a ball, butterfly, plug or damper valve. This rugged device allows for manual operation during installation, system testing and in the event of an air supply failure.

The DGO Series mounts directly to many of the most popular rack and pinion style actuators on the market, and does not require a bracket between the pneumatic actuator and declutchable override. The units come complete with a three-stage coupler that connects to the pneumatic actuator through the gear override and to the valve (or coupler).

DIRECT MOUNT ACTUATORS FOR BUTTERFLY VALVES

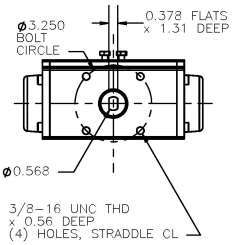
TRIAC



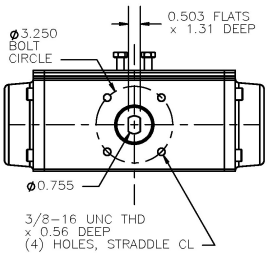
TRIAC actuators feature a wide mounting base to direct mounting to many butterfly valves without transition plates. Contact factory for compatibility with your particular butterfly valve or see A-T Controls' complete line of resilient and high performance butterfly valves.

- Available for many of the most popular resilient seated butterfly valves
- Call for details and availability
- Usually requires no additional hardware
- Lower profile packages
- Wide base accommodates pattern without transition plate

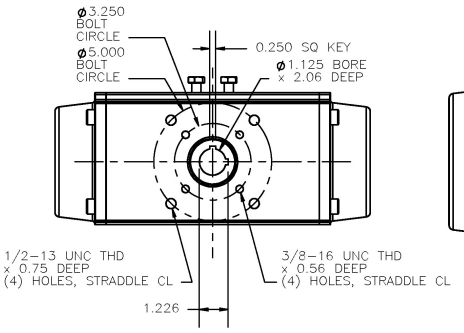
Adaptor Dimensions for 3K Series



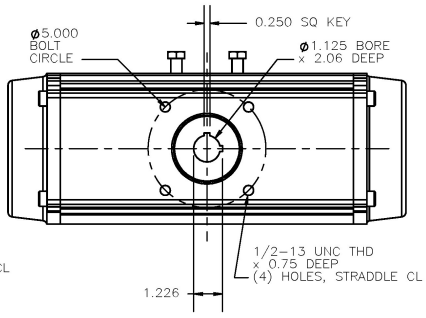
3K40



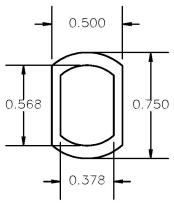
3K80 - 3K200



3K300 - 3K500



3K700 - 3K1200



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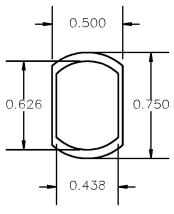

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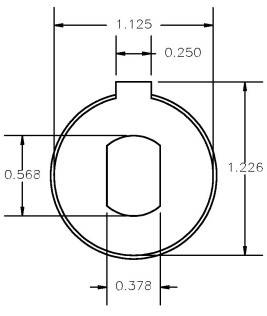

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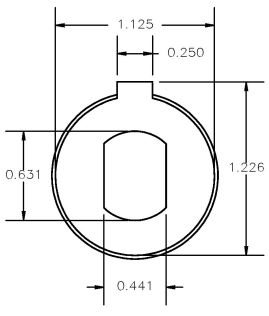
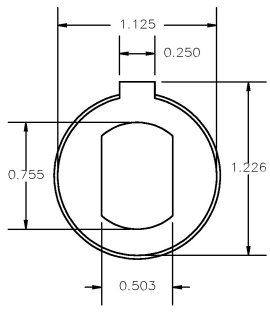


PART#:TKA–030



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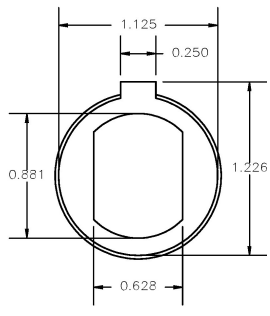

PART#:TKA–050

3R Rack & Pinion Model Number Matrix

3 Triac Rack & Pinion Actuator with dual travel stops

R Direct mount to ISO-5211/DIN 3337
K Direct mount to Keystone/ABZ/Ultraflow BFV

0000 Actuator Size (10, 20, 40, 80, 130, 200, 300, 500, 700, 850, 1000, 1200, 1750, 2400, 2700, 3300)

DA Double acting configuration
DR Double acting (Reverse acting) configuration
SR Spring return fail clockwise configuration
SO Spring return fail counter-clockwise configuration

Blank *Standard Buna seals (-5°F to 175°F)*
V Viton® Seals (0°F to 300°F)
L Low temperature Silicone seals (-45°F to 175°F)
Viton® is a trademark of E.I. DuPont de Nemours.

Blank *Standard**
0 Springs (1, 2, 3, 4, 6)
**DA/DR & Standard (5 springs)*

Blank *Standard*
E Extra long travel stops (Not available in 3R10)
1 1/4" NPT Port Modification (3R40 and larger)
2 3/8" NPT Port Modification (3R130 and larger)
3 1/2" NPT Port Modification (3R300 and larger)
4 3/4" NPT Port Modification (3R1000 and larger)
5 1" NPT Port Modification (3R2400 and larger)
N Electroless Nickel Plating
P PTFE Coating
Y Epoxy Coating
S Addition to one spring on one side

Example: **3R80SR4-E** (TRIAC Model 80 Rack & Pinion Actuator with Travel Stop in both directions, Spring Return Fail Clockwise with 4 Springs, and Extra Long Travel Stops)

Sample Specification

Actuators shall be of rugged pneumatic Rack & Pinion design. Actuator body shall be hard anodized or electroless nickel plated to promote long cycle life and corrosion resistance. The actuator body shall incorporate a heavy duty, ISO 5211 valve mounting pad with multiple ISO F-pattern bolt circles for ease of mounting. Actuator internals shall include dual aluminum pistons for a balanced torque load and a one-piece zinc plated or stainless steel blow-out proof pinion for safe operation. Actuator drive pinions shall incorporate significant body housing bearings with heavy duty O-Ring seals to promote high cycle life. The unit shall have a dual travel stop feature, with a minimum of 5° stroke adjustments on both ends of travel, to accommodate numerous valve and damper designs. All actuator fasteners and hardware shall be stainless steel for corrosion resistance. The rack & pinion actuator line shall be offered in a broad range of torque outputs. The actuator of choice shall be A-T Controls (TRIAC) 3R/3K Series Rack & Pinions.

3R2500 & 3R3500 Model Number Matrix

3 Triac Scotch Yoke Actuator with dual travel stops

R Direct mount to ISO-5211 / DIN 3337

0000 Actuator Size (2500, 3500)

- **DA** Double acting configuration
- **DR** Double acting (Reverse acting) configuration
- **SR** Spring return fail clockwise configuration
- **SO** Spring return fail counter-clockwise configuration

Blank *Standard Buna seals (-5°F to 175°F)*
- **V** Viton® Seals (0°F to 300°F)
- **L** Low temperature Silicone seals (-45°F to 175°F)

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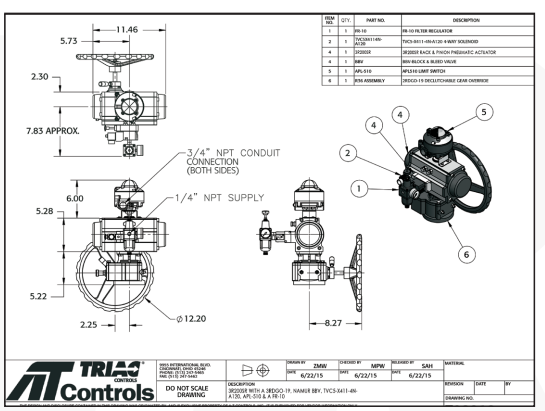
Blank *Standard - DA/DR & Standard (80 psig spring)*
- **6** 60 psig spring
- **A** 100 psig spring

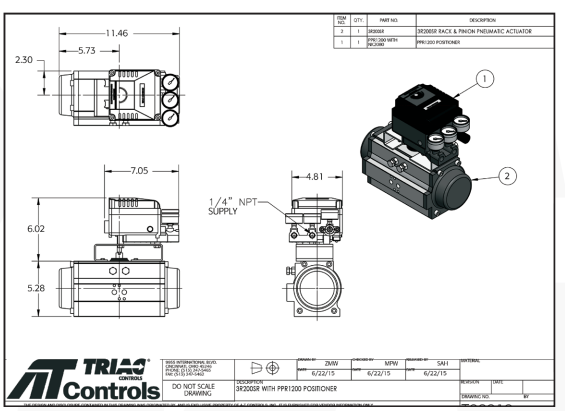
Blank *Standard*
- **2** 3/8" NPT Port
- **3** 1/2" NPT Port
- **4** 3/4" NPT Port
- **N** Electroless Nickel Plating
- **P** PTFE Coating
- **Y** Epoxy Coating

Example: **3R2500SR6-3** (TRIAC Model 2500 Scotch Yoke Actuator with Travel Stop in both directions, 60 psig Spring Return Fail Clockwise, with 1/2" NPT Port Modification)

Support and Custom Offerings

Engineering assistance and 2D & 3D model drawings available.





Complete Valve Automation

See our website for IOM's & 3D models!
www.atcontrols.com

TRIAC

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