

# **TRIAQ**<sup>®</sup>

**CONTROLS**

Division of A-T Controls



## **SY** Series

### **Scotch Yoke Multi-purpose Actuators**

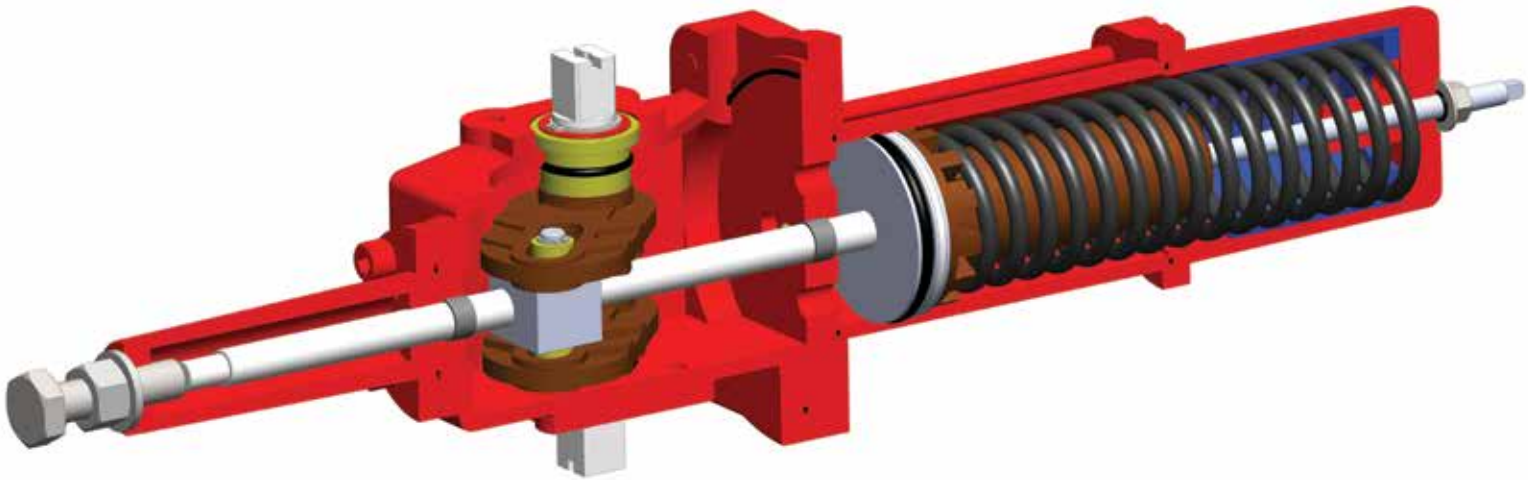
**Pneumatic Actuators  
for Quarter-Turn Valves  
and Dampers**

**Torques to 12,370 In-lbs  
Double Acting  
Spring Return**

## **SY Series** **Small Scotch Yoke Actuators**

### *Advanced Quarter Turn Actuator Technology*

part of the THD family of scotch yoke actuators



Triac® SY Series scotch yoke actuators by A-T Controls offer “workhorse” cycle operation. These rugged acutators are the compliment to the already trusted THD Series. The compact design offers options to address your quarter-turn torque requirements.

The SY Series is a reliable way to automate quarter turn valves and provides options for accessory mounting and manual override operation. The design is modular and allows for easy rotation choices. Simply flip the actuator to achieve clockwise (CW) or counterclockwise (CCW) operation.

This design features a supported scotch yoke which is stabilized by significant body bearings for minimal wear. Various spring and pressure options allow you to achieve the torque balance you need. Increased efficiencies in this design give you the most actuator for the money.

Rely on our Engineering team and solutions personnel to assist you with your applications.

## SY Spring Return Torque Chart

MODEL NUMBER		TORQUE OUTPUT IN-LBS					MOP*	MAWP**	SWEPT VOLUME CU. IN.***	WEIGHT LBS
		SPRING	40 PSI	60 PSI	80 PSI	100 PSI				
S04-SR-75-40	START	416	537	879	1256		80	125	116	42
	MIN	159	244	449	619					
	END	212	350	668	1055					
S04-SR-75-60	START	708		778	1160	1526	100	125	116	42
	MIN	266		339	514	706				
	END	310		366	767	1134				
S04-SR-75-80	START	885			1073	1439	100	125	116	42
	MIN	319			462	654				
	END	398			593	959				
S04-SR-75-100	START	1151				1343	100	125	116	44
	MIN	425				549				
	END	496				698				
S05-SR-105-40	START	1239	1310	2133	3035		80	125	214	80
	MIN	434	537	1016	1421					
	END	487	619	1355	2293					
S05-SR-105-60	START	1761		1950	2860	3732	100	125	214	80
	MIN	611		833	1247	1709				
	END	664		815	1779	2651				
S05-SR-105-80	START	2381			2642	3514	100	125	214	82
	MIN	814			1046	1508				
	END	885			1168	2040				
S05-SR-105-100	START	2921				3296	100	125	214	82
	MIN	1000				1325				
	END	1106				1509				
S05-SR-130-40	START	1947	1921	3168	4552		80	100	263	86
	MIN	699	781	1520	2145					
	END	841	903	2024	3462					
S05-SR-130-60	START	2478		2912	4308		80	110	263	86
	MIN	929		1282	1918					
	END	1089		1474	2939					
S05-SR-130-80	START	3629			3942	5284	100	125	263	89
	MIN	1239			1613	2320				
	END	1460			1805	3148				
S05-SR-130-100	START	4195				4857	100	125	263	89
	MIN	1522				2041				
	END	1894				2590				
S06-SR-130-40	START	2390	2328	3809	5441		80	125	348	117
	MIN	841	903	1776	2529					
	END	929	985	2298	4003					
S06-SR-130-60	START	3673		3351	5005	6592	100	125	348	117
	MIN	1239		1364	2136	2965				
	END	1372		971	2738	4325				
S06-SR-130-80	START	4248			4700	6287	100	125	348	122
	MIN	1505			1875	2703				
	END	1682			2171	3758				
S06-SR-130-100	START	5399				5764	100	125	348	122
	MIN	1903				2311				
	END	2213				2625				
S06-SR-180-40	START	4107	4485	7334	10464		80	110	495	144
	MIN	1469	1864	3534	4971					
	END	1752	2320	4899	8145					
S06-SR-180-60	START	6771		6263	9444	12496	100	125	495	144
	MIN	2390		2582	4064	5659				
	END	2788		2143	5520	8572				
S06-SR-180-80	START	8630			8616	11668	100	125	495	148
	MIN	3098			3366	4962				
	END	3629			3689	6741				
S06-SR-180-100	START	10311				10900	100	125	495	148
	MIN	3717				4351				
	END	4408				5084				

## SY Double Acting Torque Chart

MODEL NUMBER	TORQUE OUTPUT IN-LBS								MOP*	MAWP**	SWEPT VOLUME CU. IN.***	WEIGHT LBS
	40 PSI		60 PSI		80 PSI		100 PSI					
	START	MIN	START	MIN	START	MIN	START	MIN				
S04-DA-75	732	391	1046	584	1465	776	1831	968	100	125	116	38
S05-DA105	1758	936	2511	1395	3514	1849	4386	2311	100	125	214	67
S05-DA130	2694	1424	3846	2136	5380	2834			80	90	263	71
S06-DA-130	3182	1677	4543	2520	6357	3357	7944	4186	100	125	348	95
S06-DA-180	6096	3215	8711	4814	12191	6418			90	100	495	102

\* Maximum operating pressure (MOP) is the pressure required to produce the maximum rated torque of the actuator

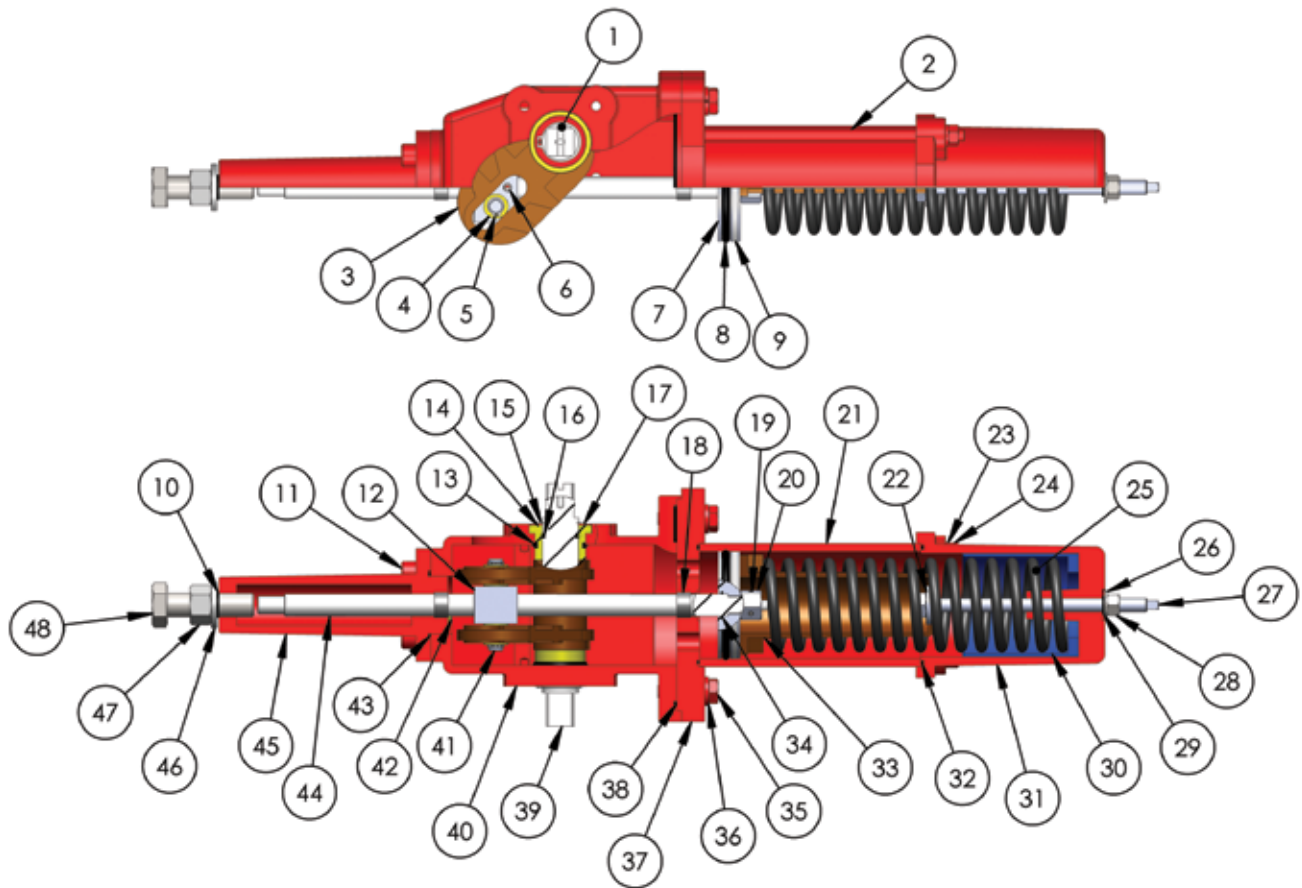
\*\* Maximum Allowable Working Pressure (MAWP) is the maximum static pressure that may be applied to a fully stroked actuator against the travels stops.

\*\*\* Swept Volume is the maximum volume including the cavity required for calculating consumption per 90° stroke.

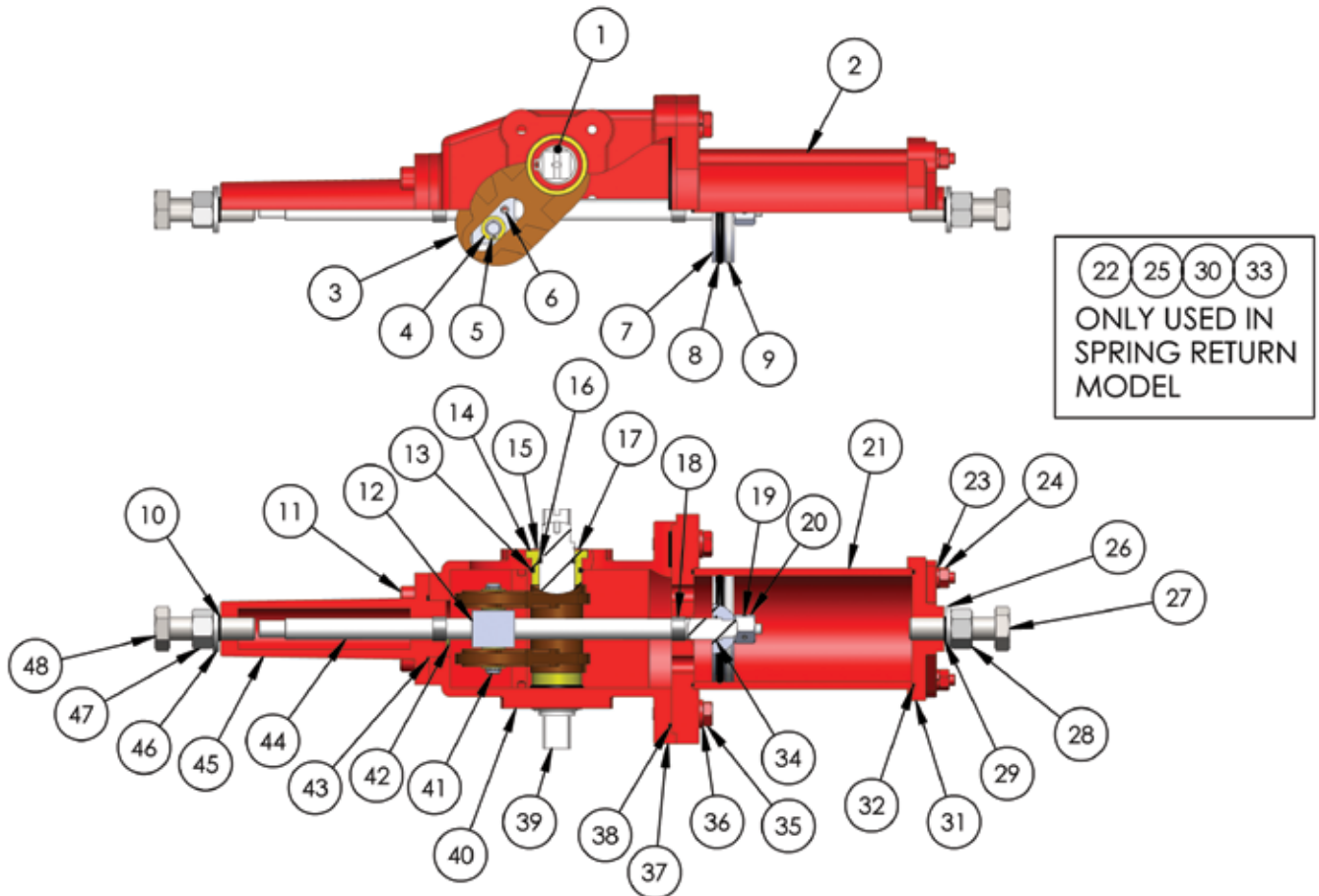
## Bill of Materials

NO.	QTY.	SEAL KIT	DESCRIPTION	MATERIAL
1	1		YOKE KEY	ANSI 1045
2	4		TIE ROD	ANSI 1045
3	1		YOKE	A536 GR. 65-45-12
4	2		YOKE BEARING	B505 C836
5	2		YOKE PIN RETAINING RING	STEEL
6	2		DRIVE BLOCK PIN	STEEL
7	1		PISTON	ASTM A36
8	1	*	PISTON O-RING	NBR
9	1		PISTON WEAR BAND	PTFE
10	1	*	STOP BOLT O-RING	NBR
11	4		ROD COVER BOLT	A193 GR. B7
12	1		DRIVE BLOCK	ANSI 1045
13	2	*	SHAFT BUSHING O-RING	NBR
14	2		YOKE SHAFT BEARING	B505 C836
15	2		YOKE SHAFT RETAINING RING	STEEL
16	2	*	YOKE SHAFT O-RING	NBR
17	2		YOKE SHAFT WASHER	A193 GR. B7
18	2		ROD BEARING	DU BEARING
19	2		LOCK NUT SETSCREW	A193 GR. B7
20	1		LOCK NUT	A194 GR. 8
21	1		CYLINDER	A106 GR. A CHROME PLATED
22	1		STOP BOLT WASHER	A193 GR. B7
23	4		TIE ROD LOCKWASHER	A193 GR. B7
24	4		TIE ROD NUT	A193 GR. B7
25	1		SPRING	SAE 9254
26	1		TRAVEL STOP BOLT WASHER	A193 GR. B7
27	1		TRAVEL STOP BOLT	A193 GR. B7
28	1		TRAVEL STOP BOLT NUT	A193 GR. B7
29	1	*	STOP BOLT O-RING	NBR
30	1		SPRING GUIDE BUSHING	NYLON 6
31	1		CYLINDER COVER	A536 GR. 65-45-12
32	2	*	CYLINDER O-RING	NBR
33	1		SPRING RETAINER	A536 GR. 65-45-12
34	1	*	PISTON ROD O-RING	NBR
35	4		FRONT FLANGE BOLT	A193 GR. B7
36	4		FRONT FLANGE LOCKWASHER	A193 GR. B7
37	1		FRONT FLANGE	A536 GR. 65-45-12
38	1	*	FRONT FLANGE O-RING	NBR
39	1		YOKE SHAFT	17-4 PH STAINLESS STEEL
40	1		HOUSING	A536 GR. 65-45-12
41	1		YOKE PIN	17-4 PH STAINLESS STEEL
42	4		ROD BEARING RETAINING SCREW	A193 GR. B7
43	1	*	PISTON ROD COVER O-RING	NBR
44	1		PISTON ROD	ANSI 4140 CHROME PLATED
45	1		ROD COVER	A536 GR. 65-45-12
46	1		TRAVEL STOP WASHER	A193 GR. B7
47	1		TRAVEL STOP NUT	A193 GR. B7
48	1		TRAVEL STOP BOLT	A193 GR. B7

\* Component of Repair Kit



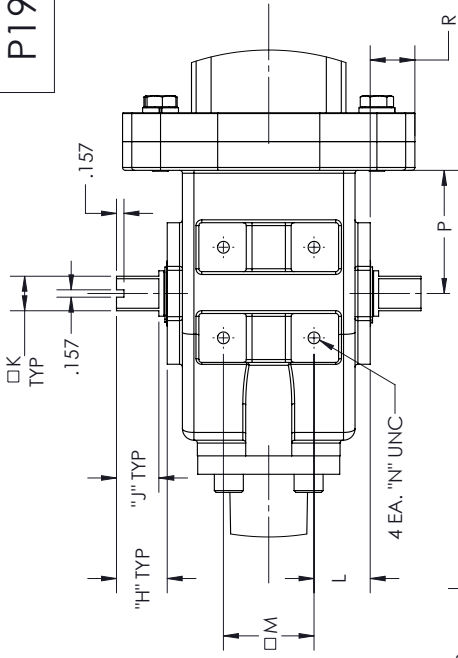
**SPRING RETURN ACTUATOR**



22 25 30 33  
 ONLY USED IN  
 SPRING RETURN  
 MODEL

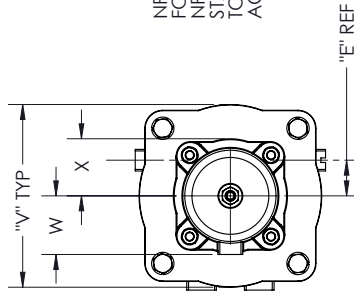
**DOUBLE ACTING ACTUATOR**

P1924

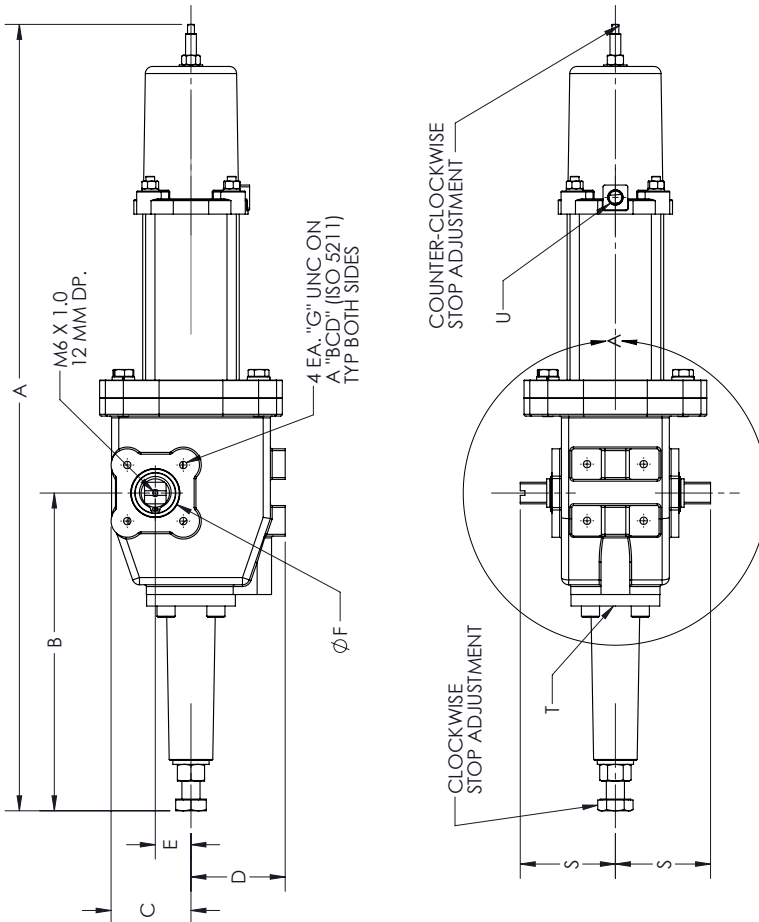


DETAIL A  
 SCALE 1 : 2.5

NPT PORT "T" IS FOR COUNTER-CLOCKWISE ROTATION FOR THE AIR STROKE WHEN VIEWED FROM TOP VIEW. NPT PORT "U" IS A BREATHER PORT STANDARD. STANDARD SPRING RETURN OPERATION IS CLOCKWISE TO CLOSE. TO REVERSE SPRING RETURN OPERATION TURN ACTUATOR OVER.



TOP VIEW



MODEL	A	B	C	D	E	F	G	BCD	H	J	K	L	M	N	P	R	S	T	U	V	W	X
S04-SR-75	26.93	10.75	2.72	3.27	1.24	1.75	5/16-18 X 0.5 DP.	2.756	1.102	0.866	0.748	1.22	1.968	5/16-18 X 0.5 DP.	2.56	0.94	3.31	1/4" NPT	1/4" NPT	6.30	2.00	1.93
S05-SR-105	32.87	13.27	3.54	3.78	1.50	2.00	3/8-16 X 0.6 DP.	4.016	1.181	0.945	0.866	1.61	1.968	5/16-18 X 0.5 DP.	3.00	1.06	3.78	3/8" NPT	1/4" NPT	7.32	2.83	2.76
S05-SR-130	33.66	13.27	3.54	3.78	1.50	2.00	3/8-16 X 0.6 DP.	4.016	1.181	0.945	0.866	1.61	1.968	5/16-18 X 0.5 DP.	3.00	1.06	3.78	3/8" NPT	1/4" NPT	7.32	3.15	3.07
S06-SR-130	39.00	15.60	4.17	4.21	1.81	2.25	1/2-13 X 0.6 DP.	4.921	1.496	1.220	1.063	1.77	2.362	5/16-18 X 0.5 DP.	3.25	1.18	4.45	3/8" NPT	1/4" NPT	8.26	3.15	3.07
S06-SR-180	41.00	15.60	4.17	4.21	1.81	2.25	1/2-13 X 0.6 DP.	4.921	1.496	1.220	1.063	1.77	2.362	5/16-18 X 0.5 DP.	3.25	1.18	4.45	3/8" NPT	1/4" NPT	8.26	4.21	4.13

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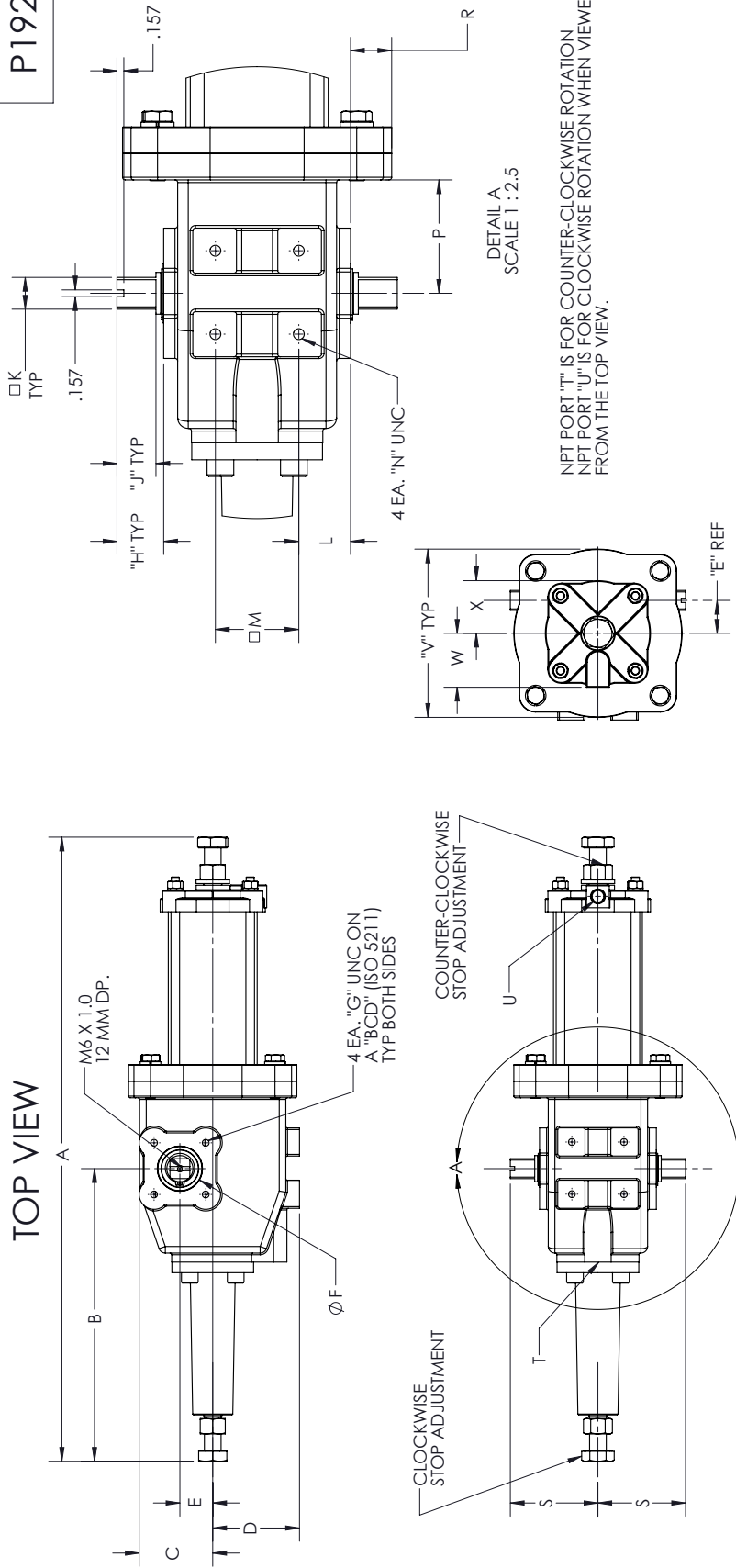
DO NOT SCALE DRAWINGS

SY SPRING RETURN DIMENSIONAL DRAWING

DESCRIPTION

# SY Series Double Acting Dimensions

P1923



MODEL	A	B	C	D	E	F	G	BCD	H	J	K	L	M	N	P	R	S	T	U	V	W	X
S04-DA-75	22.51	10.75	2.72	3.27	1.24	1.75	5/16-18 X 0.5 DP.	2.756	1.102	0.866	0.748	1.22	1.968	5/16-18 X 0.5 DP.	2.56	0.94	3.31	1/4" NPT	1/4" NPT	6.30	2.00	1.93
S05-DA-105	27.56	13.27	3.54	3.78	1.50	2.00	3/8-16 X 0.6 DP.	4.016	1.181	0.945	0.866	1.61	1.968	5/16-18 X 0.5 DP.	3.00	1.06	3.78	3/8" NPT	3/8" NPT	7.32	2.83	2.76
S05-DA-130	27.56	13.27	3.54	3.78	1.50	2.00	3/8-16 X 0.6 DP.	4.016	1.181	0.945	0.866	1.61	1.968	5/16-18 X 0.5 DP.	3.00	1.06	3.78	3/8" NPT	3/8" NPT	7.32	3.15	3.07
S06-DA-130	32.52	15.60	4.17	4.21	1.81	2.25	1/2-13 X 0.6 DP.	4.921	1.496	1.220	1.063	1.77	2.362	5/16-18 X 0.5 DP.	3.25	1.18	4.45	3/8" NPT	3/8" NPT	8.26	3.15	3.07
S06-DA-180	32.52	15.60	4.17	4.21	1.81	2.25	1/2-13 X 0.6 DP.	4.921	1.496	1.220	1.063	1.77	2.362	5/16-18 X 0.5 DP.	3.25	1.18	4.45	3/8" NPT	3/8" NPT	8.26	4.21	4.13

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SY DOUBLE ACTING ACTUATOR DIMENSIONAL DRAWING



DO NOT SCALE DRAWINGS



## TRIAC® SY Model Number Matrix

**S** - Symmetrical Scotch Yoke

**Actuator Center Body**

**04**  
**05**  
**06**

**DA** - Double Acting

**SR** - Spring Return

**Power Group**

**075**  
**105**  
**130**  
**180**

**Blank** - Double Acting  
**Spring Options**

**40**  
**60**  
**80**  
**100**

**Blank** - No Override

**D** - Declutchable Gear

**Blank** - Standard Seals (-29°C to 93°C) (-20°F to 200°F)

**V** - High Temperature Seals  
(-18°C to 177°C) (0°F to 350°F)

**L** - Low Temperature Seals  
(-40°C to 82°C) (-40°F to 180°F)

**Example:**

**S 05 SR 130 80 D - L**

(Triac SY Spring Return Actuator, fails clockwise with declutchable gear override, low temperature seals)



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