

TRIAQ[®]

CONTROLS

Division of A-T Controls



SY Series

Scotch Yoke Multi-purpose Actuators

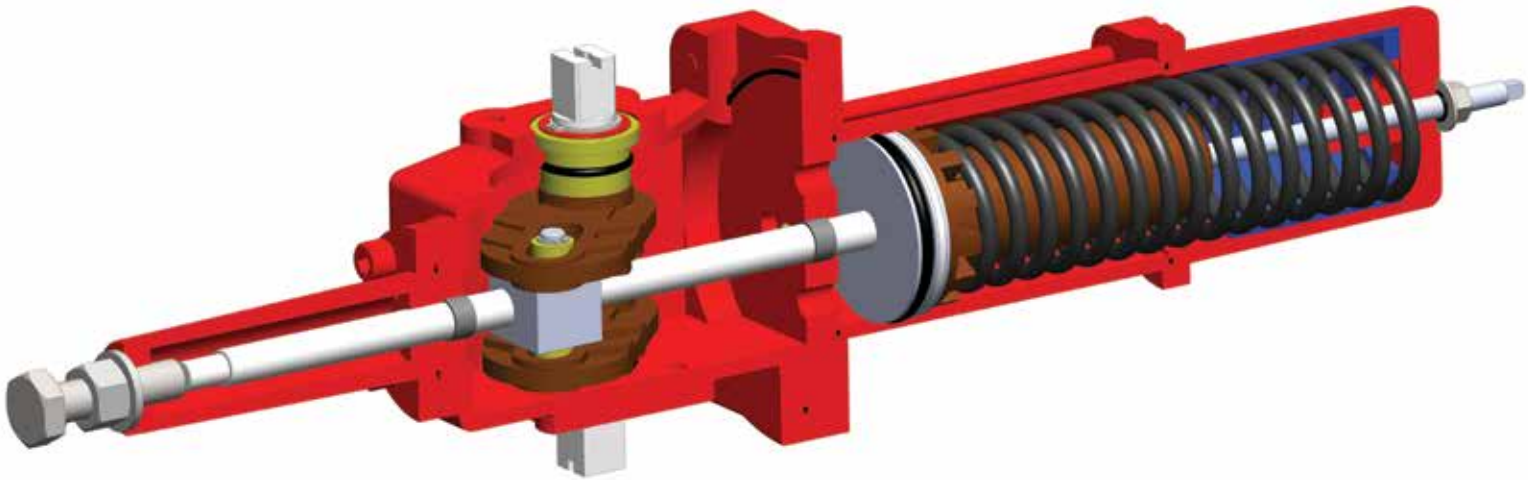
**Pneumatic Actuators
for Quarter-Turn Valves
and Dampers**

**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.

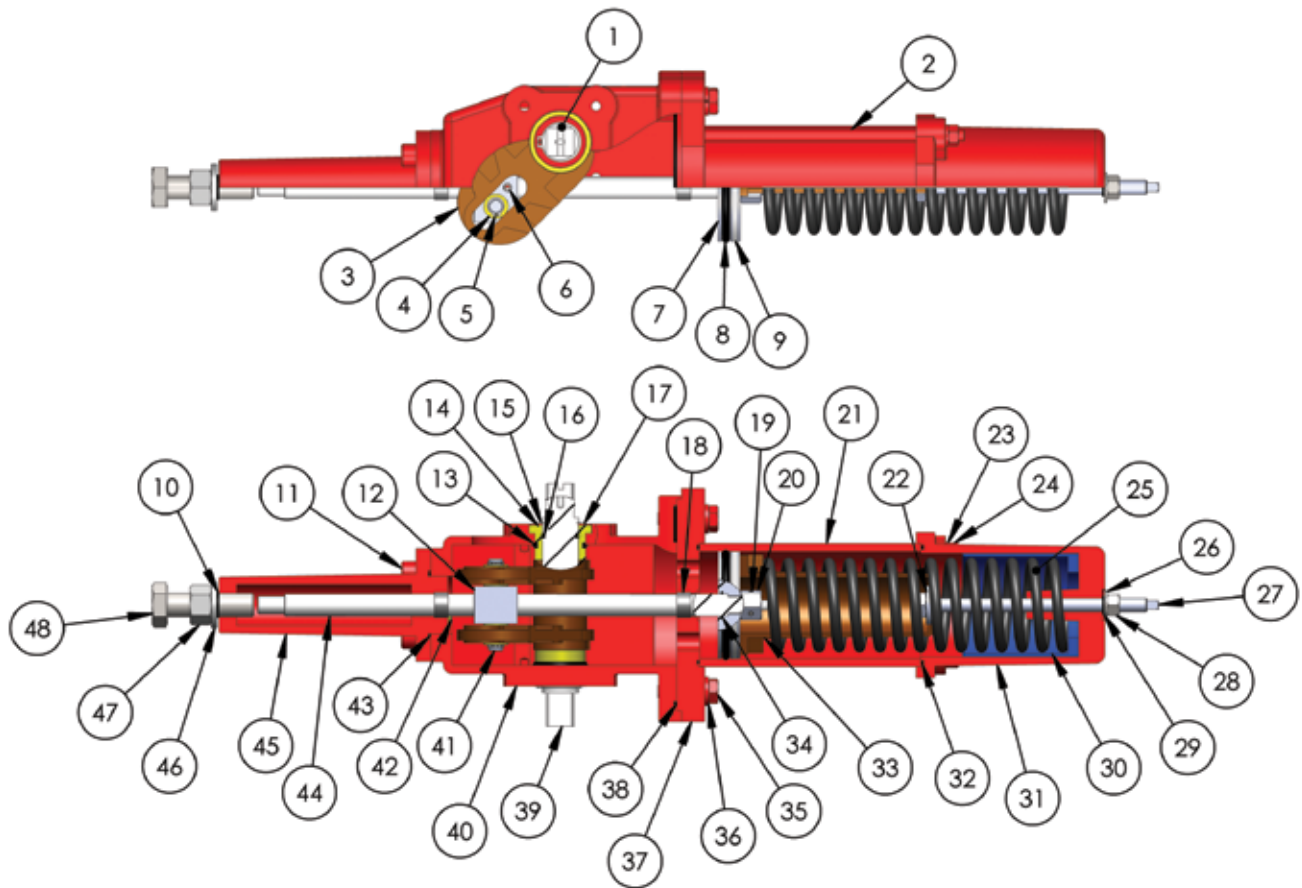
*** Swept Volume is the maximum volume including the cavity required for calculating consumption per 90° stroke.

Bill of Materials

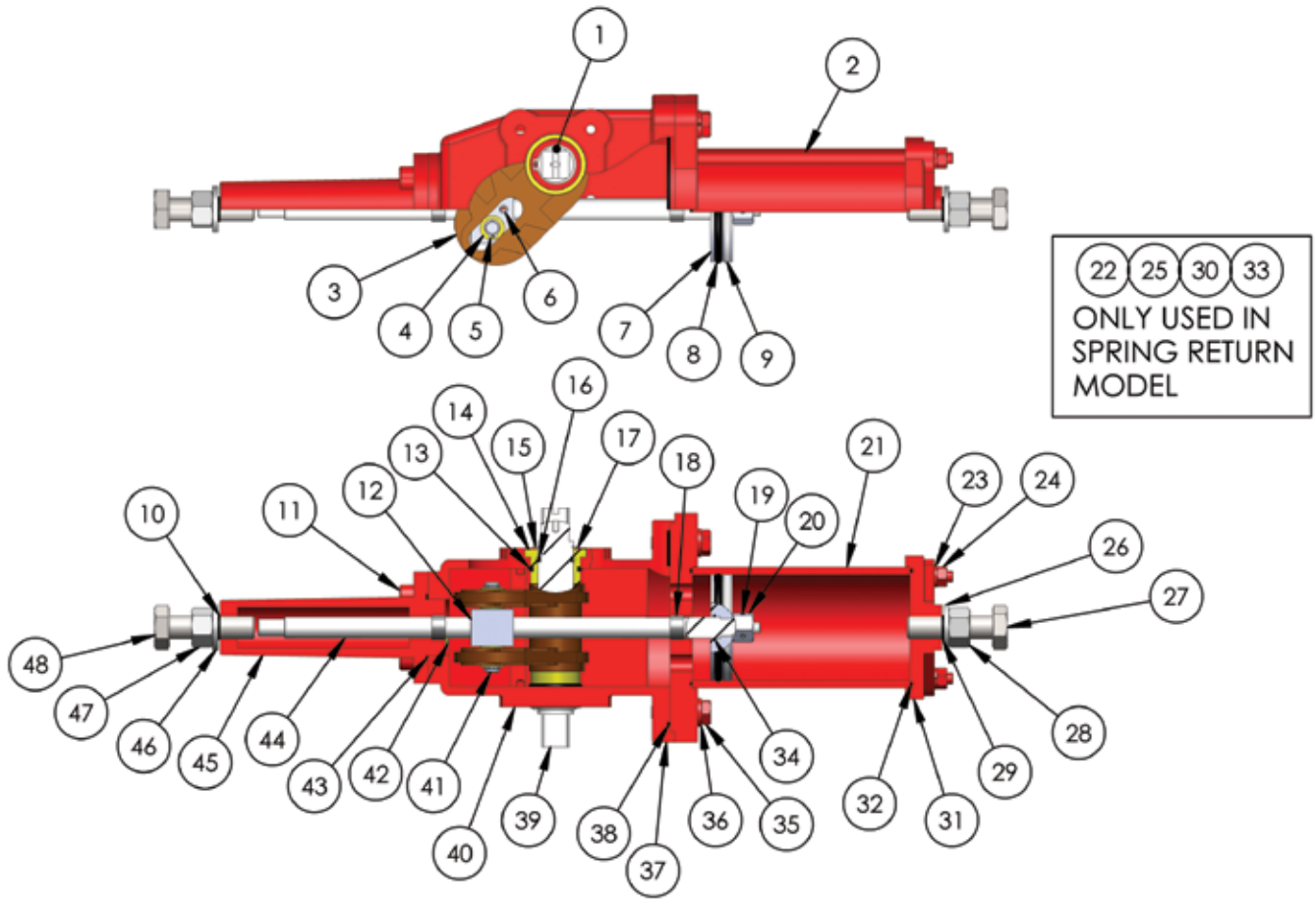
| NO. | QTY. | SEAL KIT | DESCRIPTION | MATERIAL |
|-----|------|----------|-----------------------------|--------------------------|
| 1 | 1 | | YOKE KEY | ANSI 1045 |
| 2 | 4 | | TIE ROD | ANSI 1045 |
| 3 | 1 | | YOKE | A536 GR. 65-45-12 |
| 4 | 2 | | YOKE BEARING | B505 C836 |
| 5 | 2 | | YOKE PIN 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

Distributed by Relevant Solutions | 1.888.858.3647 | relevantsolutions.com

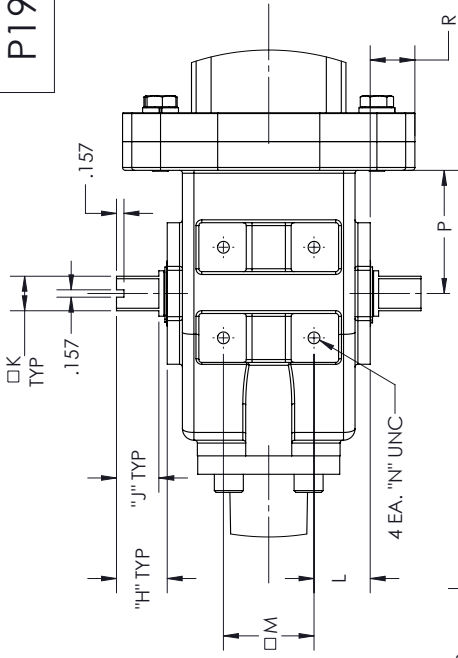


SPRING RETURN ACTUATOR



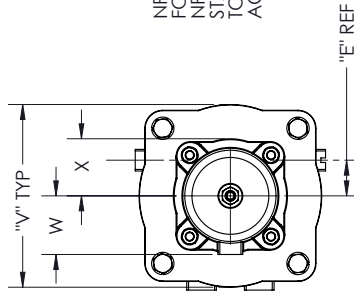
DOUBLE ACTING ACTUATOR

P1924

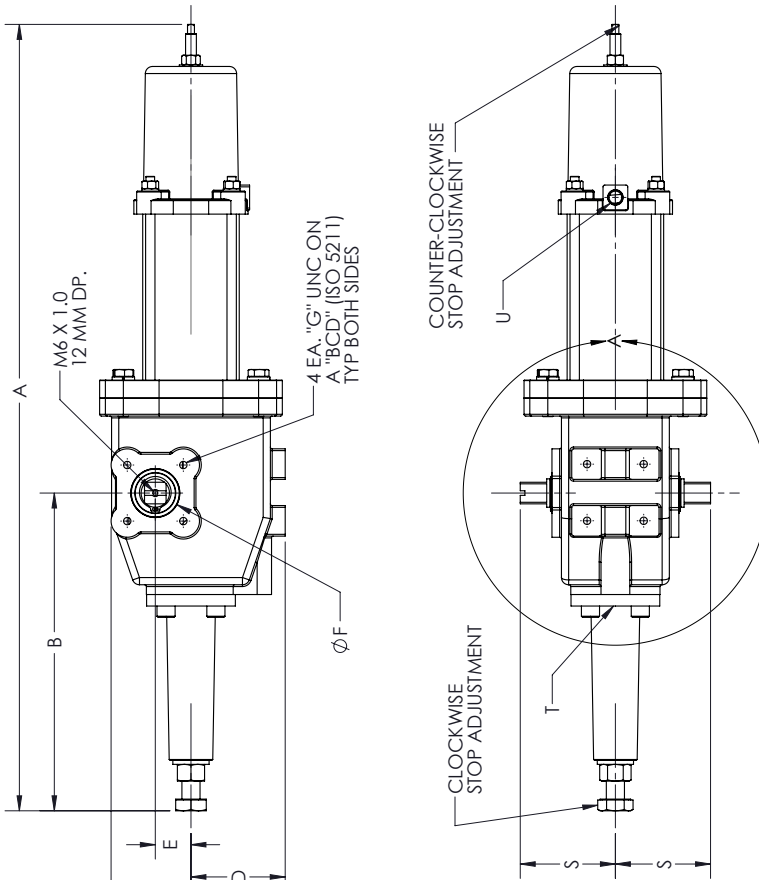


DETAIL A
SCALE 1:2.5

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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DATE: 5/22/2013

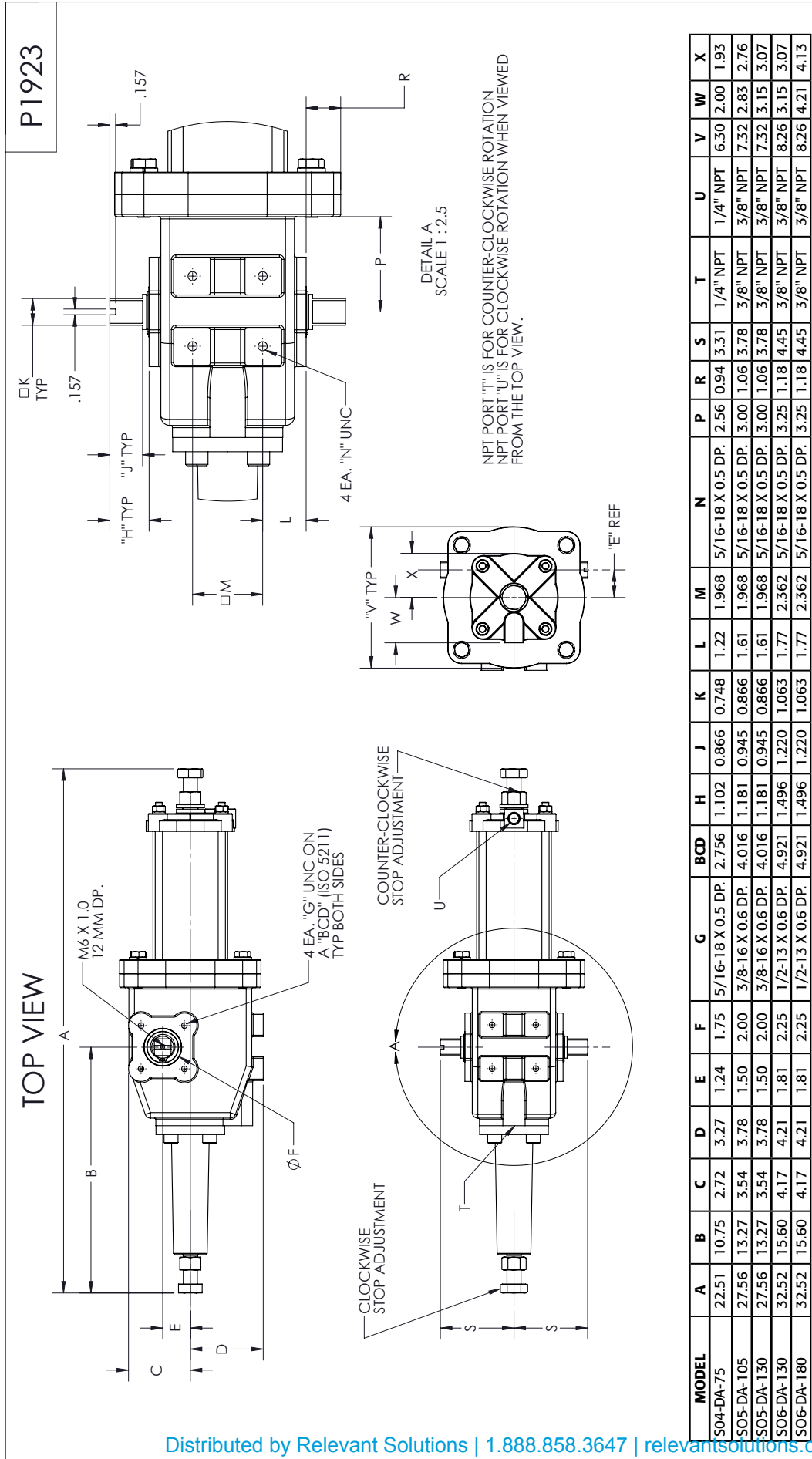
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DO NOT SCALE DRAWINGS

SY SPRING RETURN DIMENSIONAL DRAWING

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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TRIFLEX
CONTROLS

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

J - Jackscrew

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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