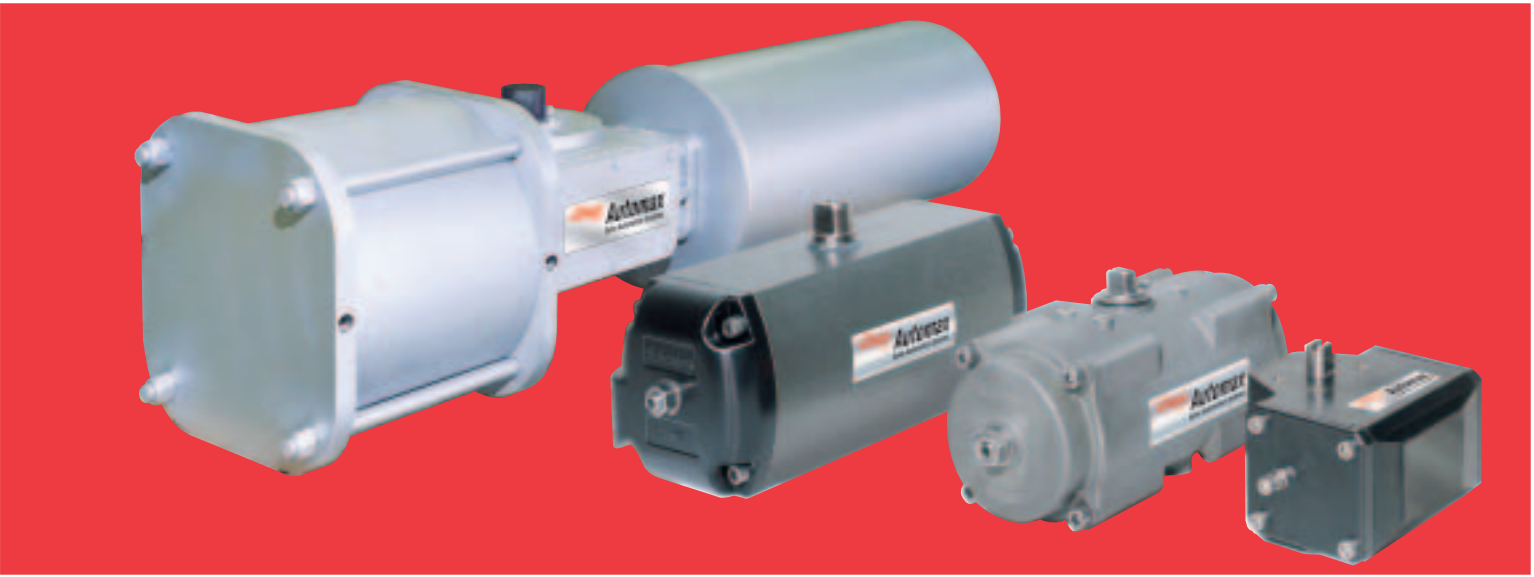
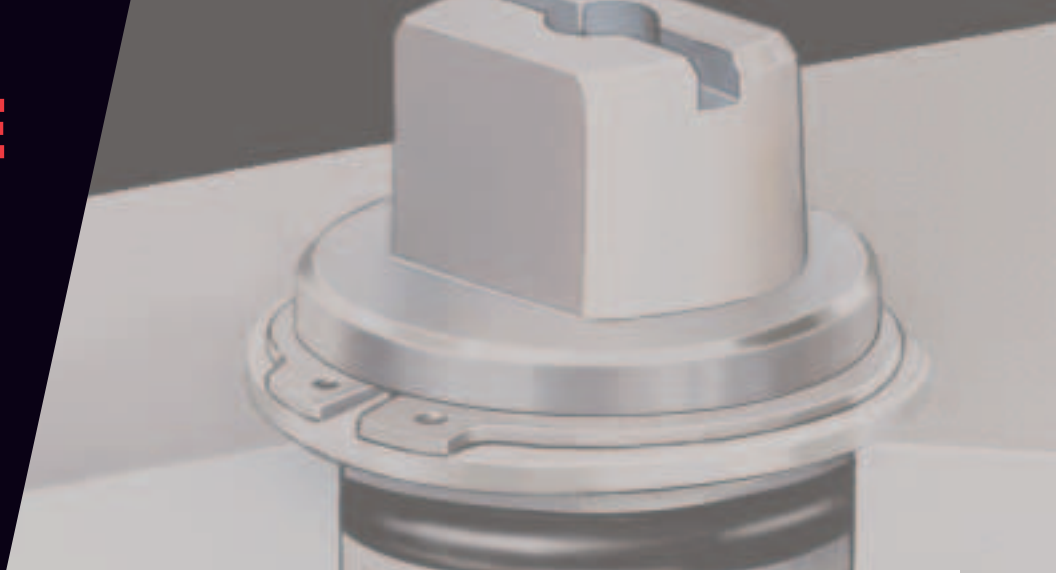


**FLowsERVE**<sup>®</sup>



***Automax Valve Automation Systems***  
***Pneumatic Actuators And Accessories***



Flowserve is the World's Premier Provider of flow management services. Flowserve manufactures Automax Valve Automation Systems to provide full service valve and damper automation to the worldwide oil and gas, pulp and paper, chemical, processing and energy related industries. We provide maximum value to the end user through a broad offering of products, services, application engineering and our systematic approach to automation.

Sales and service facilities are strategically located in industrial centers throughout the world.

**Automax Valve Automation Systems**  
**Springville, Utah; Cookeville, Tennessee; and Lynchburg, Virginia**  
Web Site: <http://www.flowserve.com> Email: [actuators@flowserve.com](mailto:actuators@flowserve.com)



**Quality, Dependability, and Productivity.**

Recognized as the leader in valve automation systems, Automax’s pneumatic actuators can automate valves with torque values from 25 to 500,000 in-lb. Actuators are available in a wide range of materials suitable for use in the most demanding applications. Flowserve also offers a comprehensive range of NAMUR Controls and accessories such as lockout modules and gear overrides. To complete the package Flowserve can provide engineering design services for AutoBrakit Mounting hardware. We currently have more than 10,000 AutoBrakits designed and documented for traceability and repeatability on a global basis.

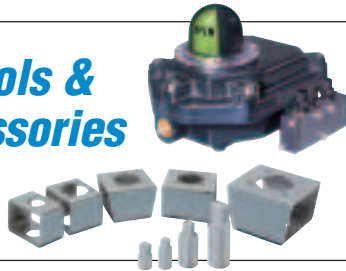
**SuperNova  
B-Series**



SuperNova B series Rack and Pinion actuators are designed for butterfly, plug or ball valves, and offer one compact design for double acting and spring return. Precision die-cast pistons with large cylinder bearings increase efficiency and cycle life. Available in torque ranges from 25 in-lb to 58,000 in-lb, for optimum actuator sizing.

Page 4-7

**Controls &  
Accessories**



The actuator is the heart of an automation system, but control accessories are important in creating a complete system to meet increasingly sophisticated customer requirements. Solenoid valves and related accessories with NAMUR interfaces provide direct, modular mounting on actuator. Switches, Positioners, Gear Overrides and Lockout Modules can also be integrated into the assembly. AutoBrakits are engineered to assure consistency and proper alignment.

Page 9

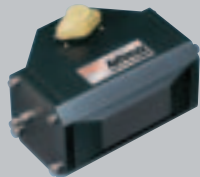
**Stainless Steel  
SXL-Series**



The SXL® series utilizes a 316 series stainless steel housing and is ideal for use in corrosive environments. It is available in both double acting and spring return and can be supplied with internal components identical to the SNA Series or with optional stainless steel internals. For sanitary applications the housing can be polished. Available in torque ranges from 78 in-lb to 7279 in-lb.

Page 10-11

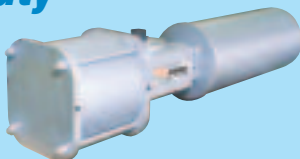
**EFC  
Epoxy-Filled  
Composite Series**



The EFC series actuator is manufactured from a combination of tough corrosion resistant epoxy and composite materials. The simple design of the EFC series ensures the minimum number of moving parts and seals. Double acting and spring return versions utilize a shuttle piston with a full diameter acetal bearing.

Page 12-13

**Heavy Duty  
R2, R3, R4  
& R5 Series**

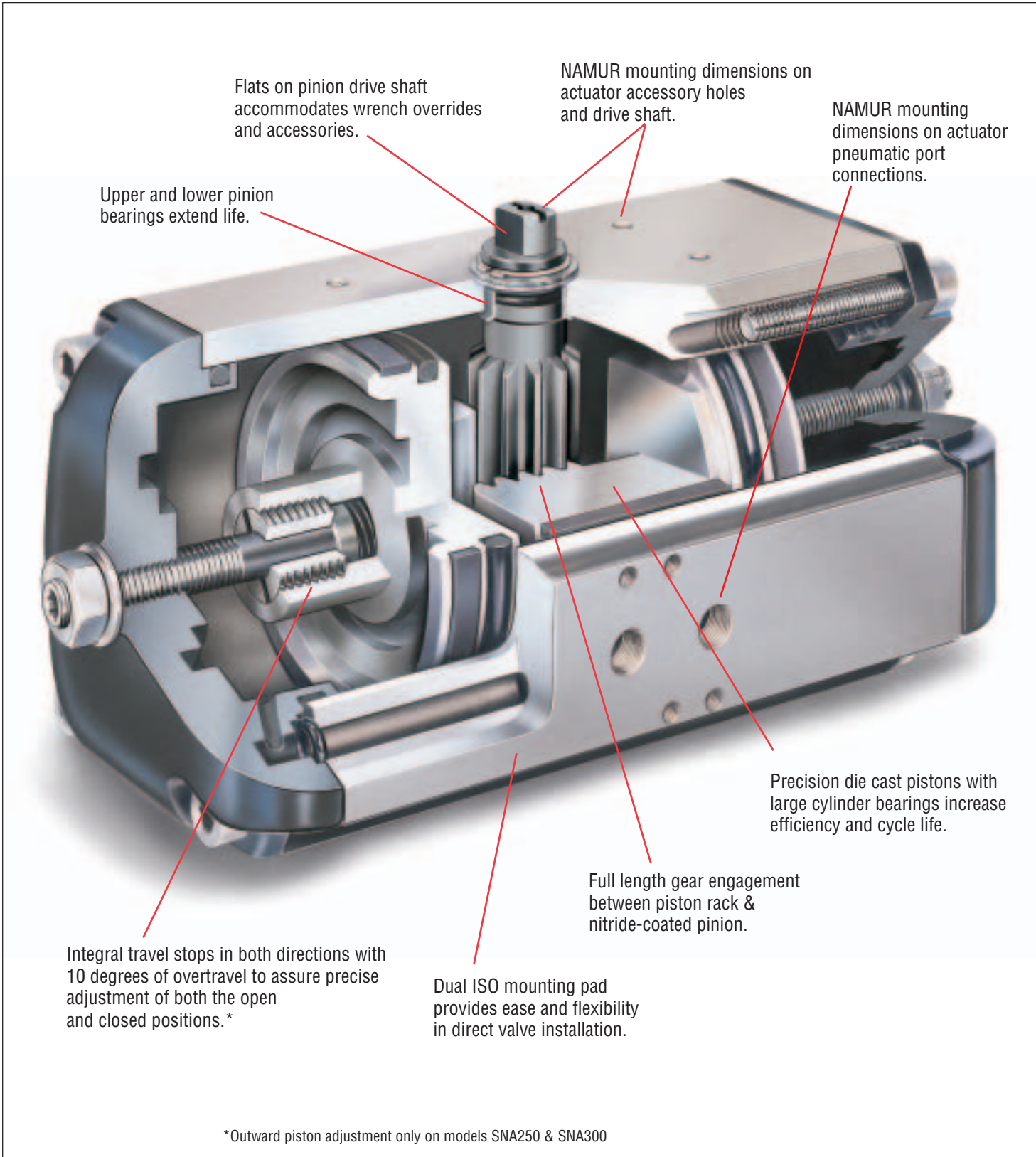


A complete line of Scotch Yoke heavy-duty actuators provides torques from 3,000 to 500,000 in-lb. The combination of Scotch Yoke actuators plus Rack and Pinion actuators offers the opportunity to standardize on one source for your complete quarter-turn automation needs. Scotch Yoke Actuators can also be configured with high pressure hydraulic cylinders. Contact Flowserve for complete details.

Page 14-19

**SuperNova B-Series**

**Double Acting**



Flats on pinion drive shaft accommodates wrench overrides and accessories.

NAMUR mounting dimensions on actuator accessory holes and drive shaft.

NAMUR mounting dimensions on actuator pneumatic port connections.

Upper and lower pinion bearings extend life.

Precision die cast pistons with large cylinder bearings increase efficiency and cycle life.

Full length gear engagement between piston rack & nitride-coated pinion.

Integral travel stops in both directions with 10 degrees of overtravel to assure precise adjustment of both the open and closed positions.\*

Dual ISO mounting pad provides ease and flexibility in direct valve installation.

\*Outward piston adjustment only on models SNA250 & SNA300



**Spring Return**

Broad size range offers optimum actuator sizing for each valve requirement.

One compact design for double acting and spring return is easily field convertible by installing or removing springs.

Field reversible action simply by rotating pistons 180°.

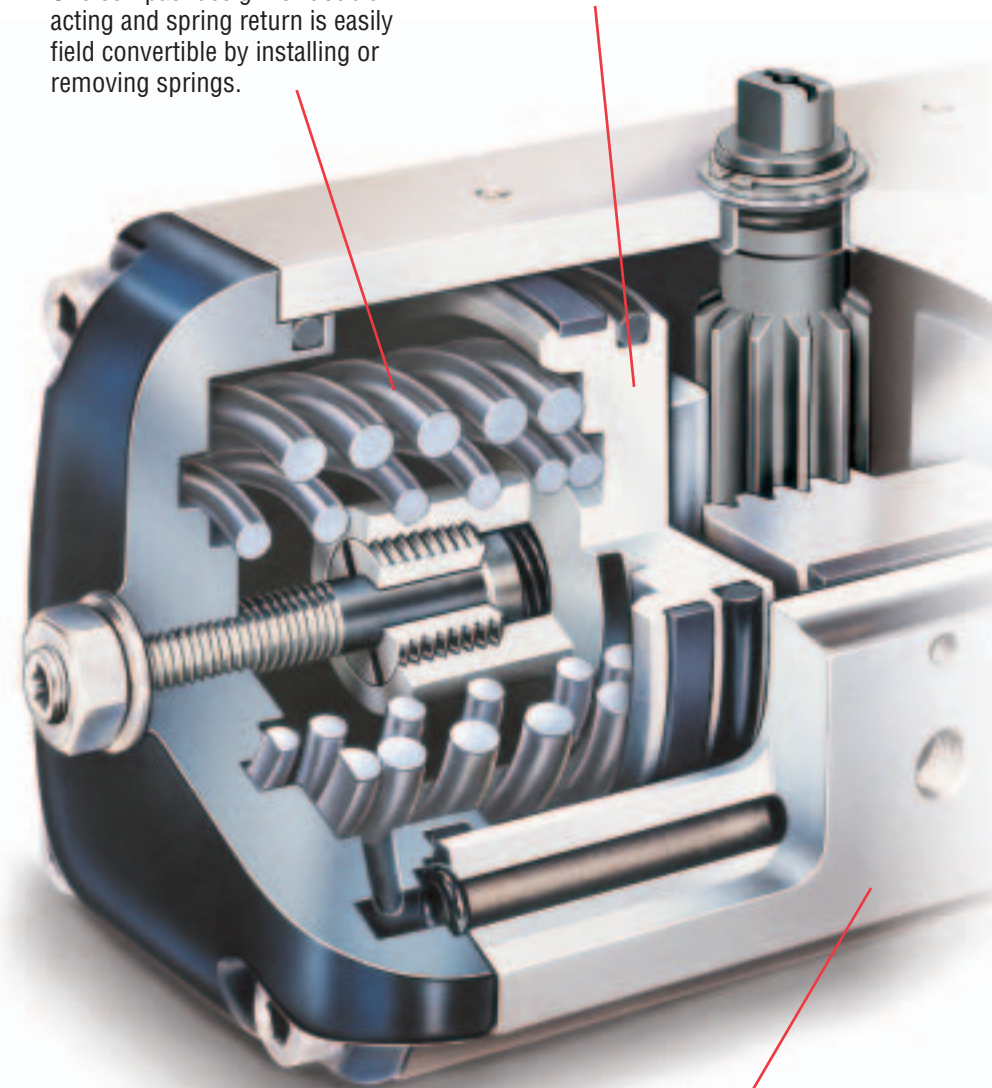
Rack & Pinion Actuators are designed for automating butterfly, plug or ball valves and dampers. The actuators incorporate a precision-extruded hard anodized aluminum body and a one-piece nitride-coated pinion gear, factory lubricated for a long trouble-free life. Actuators are designed for 100-degree travel with clockwise and counterclockwise travel adjustment for open and closed positions.

**Automax Aluminum Alloy**

Hard anodic oxidation is an electrolytic conversion process which results in the formation of an oxide film. Continuation of the process produces the “hard” anodic coating to two mils. The chemical composition provides the optimum alloy for strength, abrasion resistance, cold working and chemical resistance.

The most useful properties of the oxide coating are:

1. The oxide coating is integral with the base substrate and will not spall off by impacting thermal shock nor to temperatures to aluminum’s melting point. The oxide has negligible effect on the other properties of aluminum.
2. Aluminum oxide is one of the hardest materials known with a hardness of corundum (45 to 65 Rockwell C). Further, abrasion tests show only half as much wear as hardened steel.
3. Aluminum oxide is relatively stable and chemically inert. The oxide is usually stable over a pH range of 4.5 to 8.5, but can be dissolved by strong acids and alkalis, where as it normally resists concentrated nitric acid at pH 1 and ammonium hydroxide at pH 13.



Corrosion resistant hard anodized aluminum housings with stainless steel fasteners.

# SuperNova B-Series

## Torque Outputs

| Model | Spring |      |       | Air Supply |       |        |       |         |       |
|-------|--------|------|-------|------------|-------|--------|-------|---------|-------|
|       | No     | End  | Break | 60 Psi     |       | 80 Psi |       | 100 Psi |       |
|       |        |      |       | End        | Break | End    | Break | End     | Break |
| B050  | 5      | 36   | 55    | 56         | 76    |        |       |         |       |
|       | 6      | 43   | 64    | 46         | 69    |        |       |         |       |
|       | 7      | 49   | 73    | 35         | 63    | 74     | 102   |         |       |
|       | 8      | 61   | 92    | 15         | 49    | 54     | 88    | 93      | 127   |
|       | 9      | 73   | 110   |            |       | 34     | 74    | 73      | 113   |
| B063  | 6      | 68   | 102   | 103        | 141   |        |       |         |       |
|       | 7      | 79   | 119   | 85         | 128   |        |       |         |       |
|       | 8      | 90   | 136   | 66         | 116   |        |       |         |       |
|       | 9      | 102  | 153   |            |       | 119    | 175   |         |       |
|       | 10     | 113  | 170   |            |       | 100    | 163   |         |       |
| B085  | 6      | 141  | 211   | 215        | 293   |        |       |         |       |
|       | 7      | 164  | 246   | 177        | 267   |        |       |         |       |
|       | 8      | 188  | 282   | 138        | 241   |        |       |         |       |
|       | 9      | 211  | 317   |            |       | 248    | 365   |         |       |
|       | 10     | 235  | 352   |            |       | 209    | 339   |         |       |
| B100  | 6      | 260  | 390   | 397        | 541   |        |       |         |       |
|       | 7      | 303  | 455   | 325        | 493   |        |       |         |       |
|       | 8      | 347  | 520   | 253        | 445   |        |       |         |       |
|       | 9      | 390  | 585   |            |       | 457    | 673   |         |       |
|       | 10     | 433  | 651   |            |       | 385    | 625   |         |       |
| B115  | 6      | 430  | 645   | 656        | 894   |        |       |         |       |
|       | 7      | 502  | 753   | 537        | 814   |        |       |         |       |
|       | 8      | 573  | 860   | 418        | 735   |        |       |         |       |
|       | 9      | 645  | 968   |            |       | 756    | 1112  |         |       |
|       | 10     | 717  | 1075  |            |       | 637    | 1033  |         |       |
| B125  | 6      | 610  | 915   | 930        | 1267  |        |       |         |       |
|       | 7      | 712  | 1067  | 761        | 1155  |        |       |         |       |
|       | 8      | 813  | 1220  | 593        | 1042  |        |       |         |       |
|       | 9      | 915  | 1372  |            |       | 1071   | 1577  |         |       |
|       | 10     | 1017 | 1525  |            |       | 903    | 1464  |         |       |
| B175  | 11     | 1118 | 1677  |            |       | 734    | 1352  | 1381    | 1999  |
|       | 12     | 1220 | 1830  |            |       |        |       | 1213    | 1887  |

Note: For additional air supply pressures, consult factory or your AutoSize software program.

| Actuator | DA Torque          |       |       |       |       |
|----------|--------------------|-------|-------|-------|-------|
|          | Air Pressure (psi) |       |       |       |       |
|          | 40                 | 60    | 80    | 100   | 150   |
| A32      | 25                 | 37    | 50    | 62    | 93    |
| B050     | 78                 | 116   | 155   | 194   | 291   |
| B063     | 144                | 216   | 288   | 360   | 539   |
| B085     | 299                | 449   | 598   | 748   | 1122  |
| B100     | 552                | 828   | 1104  | 1380  | 2071  |
| B115     | 913                | 1369  | 1826  | 2282  | 3423  |
| B125     | 1294               | 1941  | 2588  | 3236  | 4853  |
| B150     | 2329               | 3494  | 4658  | 5823  | 8734  |
| B175     | 3487               | 5230  | 6974  | 8717  | 13076 |
| B200     | 4970               | 7455  | 9940  | 12424 | 18637 |
| SNA250   | 10354              | 15531 | 20707 | 25884 | 38826 |
| SNA300   | 15529              | 23293 | 31057 | 38822 | 58232 |

| Model         | Spring |       |       | Air Supply |       |        |       |         |       |
|---------------|--------|-------|-------|------------|-------|--------|-------|---------|-------|
|               | No     | End   | Break | 60 Psi     |       | 80 Psi |       | 100 Psi |       |
|               |        |       |       | End        | Break | End    | Break | End     | Break |
| B150          | 6      | 1098  | 1648  | 1673       | 2280  |        |       |         |       |
|               | 7      | 1281  | 1922  | 1369       | 2078  |        |       |         |       |
|               | 8      | 1465  | 2197  | 1066       | 1875  |        |       |         |       |
|               | 9      | 1648  | 2471  |            |       | 1927   | 2837  |         |       |
|               | 10     | 1831  | 2746  |            |       | 1624   | 2635  |         |       |
| B175          | 11     | 2014  | 3020  |            |       | 1320   | 2432  | 2485    | 3597  |
|               | 12     | 2198  | 3295  |            |       |        |       | 2182    | 3394  |
|               | 6      | 1606  | 2527  | 2438       | 3457  |        |       |         |       |
|               | 7      | 1899  | 2907  | 2079       | 3133  |        |       |         |       |
|               | 8      | 2153  | 3349  | 1530       | 2851  |        |       |         |       |
| B200          | 9      | 2427  | 3759  |            |       | 2820   | 4292  |         |       |
|               | 10     | 2701  | 4170  |            |       | 2366   | 3989  |         |       |
|               | 11     | 2975  | 4581  |            |       | 1912   | 3686  | 3656    | 5430  |
|               | 12     | 3249  | 4992  |            |       |        |       | 3201    | 5127  |
|               | 6      | 2343  | 3516  | 3568       | 4864  |        |       |         |       |
| SNA250        | 7      | 2734  | 4107  | 2914       | 4432  |        |       |         |       |
|               | 8      | 3125  | 4691  | 2269       | 4000  |        |       |         |       |
|               | 9      | 3515  | 5277  |            |       | 4106   | 6053  |         |       |
|               | 10     | 3906  | 5865  |            |       | 3456   | 5622  |         |       |
|               | 11     | 4296  | 6451  |            |       | 2808   | 5190  | 5293    | 7674  |
| SNA300        | 12     | 4687  | 7037  |            |       |        |       | 4645    | 7243  |
|               | 6      | 2854  | 6591  | 7421       | 12025 |        |       |         |       |
|               | 7      | 3393  | 7690  | 6448       | 11441 |        |       |         |       |
|               | 8      | 3945  | 8788  | 5428       | 10857 |        |       |         |       |
|               | 9      | 4519  | 9887  | 4373       | 10273 | 9780   | 15450 |         |       |
| SNA250-SNA300 | 10     | 5106  | 10985 | 3274       | 9689  | 8566   | 14866 |         |       |
|               | 11     | 5715  | 12084 |            |       | 7352   | 14281 | 12529   | 19458 |
|               | 12     | 6343  | 13182 |            |       | 6138   | 13697 | 11314   | 18874 |
|               | 6      | 4744  | 11096 | 9931       | 17473 |        |       |         |       |
|               | 7      | 5640  | 12945 | 8245       | 16501 |        |       |         |       |
| SNA300        | 8      | 6558  | 14795 | 6482       | 15530 |        |       |         |       |
|               | 9      | 7512  | 16644 | 4658       | 14559 | 12669  | 22326 |         |       |
|               | 10     | 8487  | 18493 | 2762       | 13588 | 10625  | 21355 |         |       |
|               | 11     | 9500  | 20343 |            |       | 8581   | 20384 | 16348   | 28150 |
|               | 12     | 10543 | 22192 |            |       | 6537   | 19412 | 14304   | 27179 |

Spring Chart B050 ②

| Spring Group | Spring Combination ① |                            |                             |
|--------------|----------------------|----------------------------|-----------------------------|
|              | #1 Spring (inner)    | #2 Spring (low rate outer) | #3 Spring (high rate outer) |
| 4            | 1 ③                  | 1 ③                        |                             |
| 5            |                      | 2                          |                             |
| 6            | 2                    | 1                          |                             |
| 7            | 1                    | 2                          |                             |
| 8            | 2                    | 2                          |                             |
| 9            | 2                    |                            | 2                           |

Note: ① #1 Spring has one color code dot  
 #2 Spring has two color code dots  
 #3 Spring has three color code dots  
 ② B050 has maximum of 2 springs per endcap  
 ③ Install springs on opposite sides

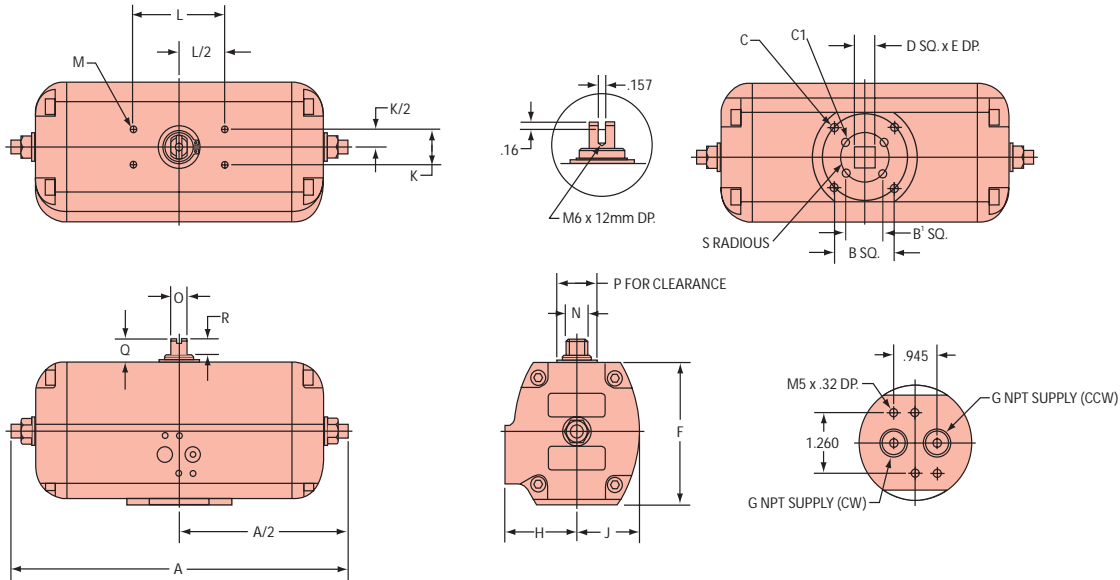
Spring Chart B063-B200

| Spring Group | Spring Combination ① |                    |                   |
|--------------|----------------------|--------------------|-------------------|
|              | #1 Spring (inner)    | #2 Spring (middle) | #3 Spring (outer) |
| 4            |                      | 2                  |                   |
| 5            |                      | 1 ③                | 1 ③               |
| 6            |                      |                    | 2                 |
| 7            | 1                    |                    | 2                 |
| 8            | 2                    |                    | 2                 |
| 9            | 1 ③                  | 1 ③                | 2                 |
| 10           |                      | 2                  | 2                 |
| 11           | 1                    | 2                  | 2                 |
| 12           | 2                    | 2                  | 2                 |

### SNA250-SNA300 Spring Combinations

Spring number is total number of springs in endcaps. There should never be a difference in springs per endcap greater than one. Example: SNA250S09 would have four springs in one endcap and five in the other.

## Dimensions



- ① Actuator shown in the full clockwise (CW) position as viewed from top.  
② Accessory mounting holes not for gear override or stop block.
- ③ Cycle times 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.

| Model | ISO         | A     |       | B SQ. | B' SQ. | C           | C'          | D     | E    | F    | G NPT | H    | J    | K     | L     | M②③    | N    | O     | P    | Q    | R   | Weights (lbs) |      | Volume (in) |     | Cycle Time |     |     |
|-------|-------------|-------|-------|-------|--------|-------------|-------------|-------|------|------|-------|------|------|-------|-------|--------|------|-------|------|------|-----|---------------|------|-------------|-----|------------|-----|-----|
|       |             | DA&SR | 180   |       |        |             |             |       |      |      |       |      |      |       |       |        |      |       |      |      |     | DA            | SR   | CW          | CCW | CW         | CCW | .5  |
| B050  | F04S11E     | 6.69  | 8.70  | 1.169 | N/A    | #10-24x.31  | N/A         | .433  | .47  | 2.56 | 1/8   | 1.58 | 1.14 | 1.181 | 3.150 | #10-24 | .47  | .394  | .75  | .79  | .39 | .39           | 2.7  | 3.1         | 8.2 | 5.4        | .5  | .5  |
| B063  | F03/F05S14E | 7.95  | 9.92  | 1.392 | 1.002  | 1/4-20x.31  | #10-24x.31  | .551  | .63  | 3.19 | 1/8   | 1.77 | 1.40 | 1.181 | 3.150 | #10-24 | .47  | .394  | .88  | .79  | .39 | .39           | 3.8  | 4.4         | 16  | 10         | .5  | .5  |
| B085  | F05/F07S17E | 9.84  | 12.13 | 1.949 | 1.392  | 5/16-18x.31 | 1/4-20x.31  | .669  | .75  | 4.15 | 1/8   | 2.24 | 1.87 | 1.181 | 3.150 | #10-24 | .77  | .551  | 1.00 | .79  | .55 | .55           | 7.5  | 9.3         | 34  | 20         | .5  | .5  |
| B100  | F05/F07S17E | 11.65 | 14.80 | 1.949 | 1.392  | 5/16-18x.31 | 1/4-20x.31  | .669  | .75  | 4.80 | 1/4   | 2.48 | 2.17 | 1.181 | 3.150 | #10-24 | .77  | .551  | 1.38 | .79  | .55 | .55           | 11.5 | 14.6        | 56  | 38         | 1   | .5  |
| B115  | F07/F10S22E | 13.47 | 17.60 | 2.840 | 1.949  | 3/8-16x.39  | 5/16-18x.31 | .866  | .98  | 5.30 | 1/4   | 2.91 | 2.46 | 1.181 | 5.118 | #10-24 | 1.10 | .787  | 1.63 | 1.18 | .79 | .79           | 17.7 | 22.5        | 94  | 65         | 1   | 1   |
| B125  | F07/F10S22E | 15.83 | 20.35 | 2.840 | 1.949  | 3/8-16x.39  | 5/16-18x.31 | .866  | .98  | 5.79 | 1/4   | 3.07 | 2.68 | 1.181 | 5.118 | #10-24 | 1.10 | .787  | 2.00 | 1.18 | .79 | .79           | 23.8 | 30.2        | 128 | 90         | 1   | 1   |
| B150  | F10/F12S27E | 19.13 | 25.20 | 3.480 | 2.840  | 1/2-13x.45  | 3/8-16x.39  | 1.063 | 1.18 | 6.85 | 1/4   | 3.47 | 3.19 | 1.181 | 5.118 | #10-24 | 1.87 | 1.417 | 2.38 | 1.18 | .89 | .89           | 40.8 | 51.2        | 224 | 159        | 2.0 | 1.5 |
| B175  | F10/F14S36E | 21.34 | 28.58 | 3.897 | 2.840  | 5/8-11x.63  | 3/8-16x.39  | 1.417 | 1.57 | 8.21 | 1/4   | 4.17 | 3.74 | 1.181 | 5.118 | #10-24 | 1.87 | 1.417 | 2.75 | 1.18 | .89 | .89           | 63.7 | 77.2        | 351 | 232        | 3.0 | 2.0 |
| B200  | F10/F14S36E | 24.41 | 31.69 | 3.897 | 2.840  | 5/8-11x.63  | 3/8-16x.39  | 1.417 | 1.57 | 9.39 | 1/4   | 4.72 | 4.25 | 1.181 | 5.118 | #10-24 | 1.97 | 1.417 | 2.94 | 1.18 | .89 | .89           | 91.5 | 118         | 507 | 332        | 4.5 | 3.0 |

Note: Double Acting  
 Pressure at port "CW" will result in clockwise rotation. Pressure at port "CCW" will result in counter-clockwise rotation.  
 Note: Spring Return  
 Pressure at port "CCW" will result in counterclockwise rotation. Springs provide clockwise rotation upon loss of pressure.

### How To Order (Select Bold Type Code from each column that applies)

| MODEL         | TYPE                          | Springs (Select One)① |           |           |           | Seals   | Materials  | Options  |
|---------------|-------------------------------|-----------------------|-----------|-----------|-----------|---|--|--|
|               |                               | 050 Thru 300          |           |           |           |   |  |  |
| <b>B050</b>   | <b>D</b> Double Acting        | <b>04</b>             | <b>05</b> | <b>06</b> | <b>07</b> | <b>Blank</b> - Buna (Std.)<br><b>L</b> Low Temp.<br><b>H</b> Viton (High Temp.) | <b>Blank</b> - Std. Hard Anodized Aluminum<br><b>K</b> K-Mass Coated<br><b>W</b> White Epoxy Coated<br><b>G</b> Gray Epoxy Coated<br><b>X</b> BlackMax Coating | <b>R</b> Extra Long Travel Stop<br><b>C</b> Stainless Steel Pinion/Snap Ring |
| <b>B063</b>   | <b>S</b> Spring Return (FCW)  | <b>08</b>             | <b>09</b> | <b>10</b> |           |   |  |  |
| <b>B085</b>   | <b>C</b> Spring Return (FCCW) | <b>11</b>             | <b>12</b> |           |           |   |  |  |
| <b>B100</b>   | <b>M</b> 180° Double Acting   |                       |           |           |           |   |  |  |
| <b>B115</b>   |                               |                       |           |           |           |   |  |  |
| <b>B125</b>   |                               |                       |           |           |           |   |  |  |
| <b>B150</b>   |                               |                       |           |           |           |   |  |  |
| <b>B175</b>   |                               |                       |           |           |           |   |  |  |
| <b>B200</b>   |                               |                       |           |           |           |   |  |  |
| <b>SNA250</b> |                               |                       |           |           |           |   |  |  |
| <b>SNA300</b> |                               |                       |           |           |           |   |  |  |

①Consult torque charts or AutoSize for applicable spring combinations.  
 Example: A model B100 spring return (FCW) spring set 10, would be coded as **B100S10**

# SuperNova Models SNA250 & SNA300 90° Units and 180° Actuators

SNA250



Typical 180° Rotary Actuator

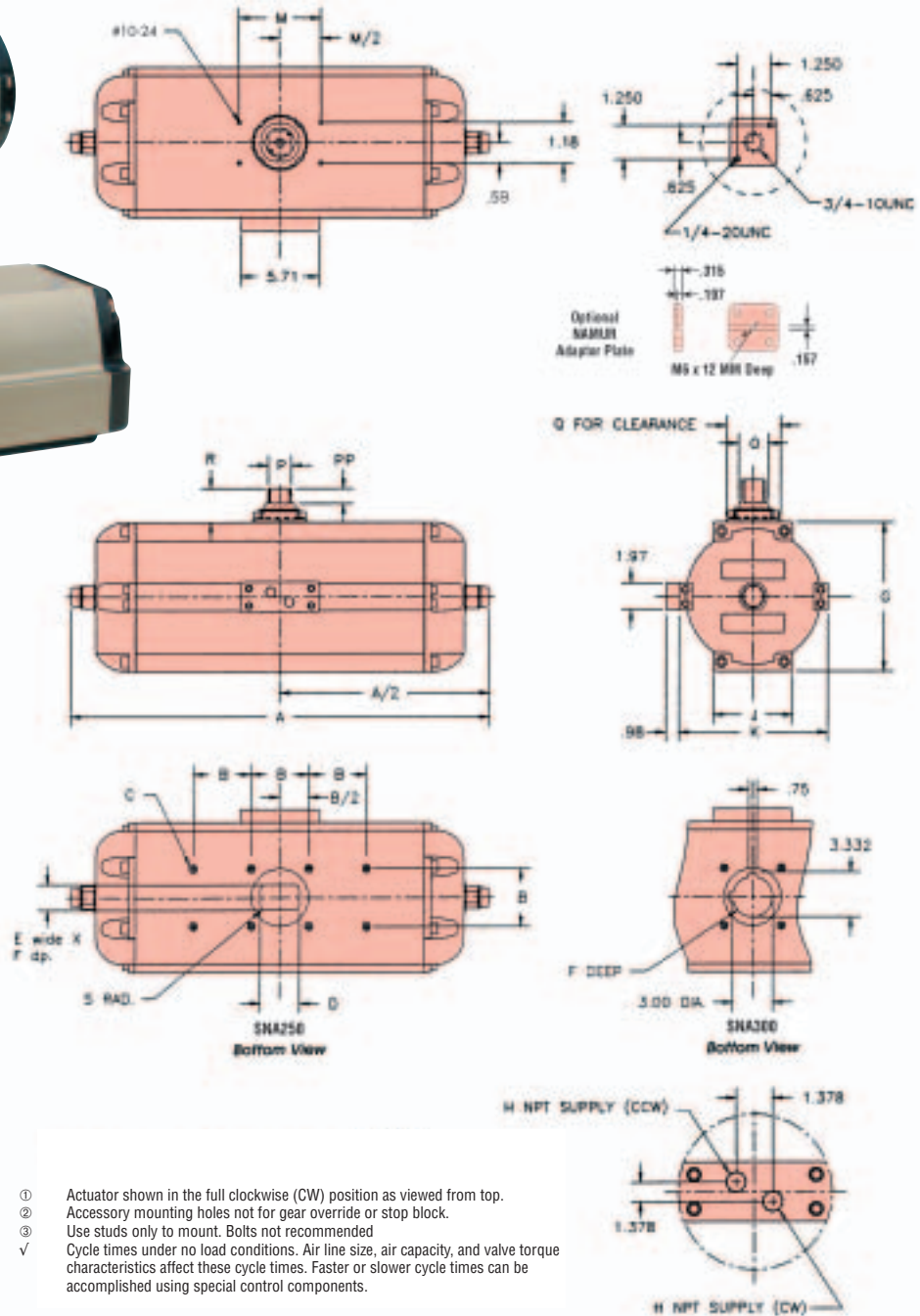
## 180° Rack & Pinion Actuators

Automax 180 Degree Actuators are available in the same models and with the same torque outputs as the standard SuperNova Double Acting actuators. The integral mechanical, end-of-stroke travel adjustment is for one direction only. As options, travel stops can be furnished for less than 180° travel and an additional travel stop for the other direction can be provided in the valve actuator adaption.

Automax has developed economical control circuits and devices to actuate multiport valves both  
 2 position (0°, 180°) and  
 3 position (0°, 90°, 180°)  
 utilizing the UltraSwitch. Consult your Automax Representative for assistance in selecting the best control package.

Dimensions for 50-200 size 180° actuators on previous page.

## Dimensions



| MODEL  | A     |       | B     | C          | D    | E     | F    | G     | H   | J    | K     | M     | O    | P     | PP   | Q    | R    | S   | WEIGHTS |     | VOLUME |      | CYCLE TIME |     |
|--------|-------|-------|-------|------------|------|-------|------|-------|-----|------|-------|-------|------|-------|------|------|------|-----|---------|-----|--------|------|------------|-----|
|        | DA&SR | 180   |       |            |      |       |      |       |     |      |       |       |      |       |      |      |      |     | DA      | SR  | CW     | CCW  | CW         | CCW |
| SNA250 | 27.32 | 39.14 | 4.250 | 5/8-11X.63 | 2.87 | 1.850 | 1.81 | 11.02 | 1/2 | 5.91 | 11.02 | 5.118 | 2.20 | 1.969 | 0.98 | 3.75 | 1.65 | .24 | 137     | 172 | 757    | 720  | 5-7        | 5-7 |
| SNA300 | 32.60 | 44.00 | 5.000 | 5/8-11X.94 | N/A  | N/A   | 2.50 | 13.39 | 1/2 | 6.30 | 13.39 | 5.118 | 2.44 | 1.969 | 0.98 | 3.75 | 1.65 | N/A | 217     | 288 | 1403   | 1019 | 6-9        | 6-9 |

For "How To Order" see page 7

## Controls



### **A25N Directional Valve\***

The Automax Directional Valve mounts directly to SuperNova series actuators which eliminates the cost of tubing and fittings. The valves are available for double acting and spring return actuators with NEMA 4X, 7 & 9, or intrinsically-safe and low power solenoid operators. These valves have been tested and proven reliable for over 1 million cycles.



### **APS1 Module\***

The Automax APS1 module works with the Automax A25N solenoid valve and diverts exhaust air from between the pistons into the spring chamber. This prevents corrosive atmospheres from being pulled into the spring chamber.



### **APS2 Module\***

The Automax APS2 module works with remote/line mounted solenoid valves and diverts exhaust air from between the pistons into the spring chamber. This prevents corrosive atmospheres from being pulled into the spring chamber.



### **LV1 Lockout & Vent Valve\***

The LV1 Lockout and Vent Valve module provides two primary functions. The LV1 may be used with a manual override to shut off supply air and vent actuator ports. The LV1 may also be used as a pneumatic lockout valve which, when properly implemented, will satisfy OSHA Standard 1910.47. The LV1 may be sandwich mounted with other Automax NAMUR accessories or may be used with the NPT1 adaptor.



### **FC1, FCDA & FCSR\***

The 'FC' Series Flow Control modules provide compact flow controls for precise adjustment of SuperNova actuator speeds. The Flow Control Modules may be sandwich mounted with other Automax accessories or may be used with the NPT1 adaptor.

## Accessories



### **"Pharos" NAMUR Indicator\***

Provides an economical solution for positive visual indication of the actuator position. Constructed of tough industrial engineered resin, the UltraIndicator can be used on actuators that utilize a NAMUR mounting interface.



### **UltraSwitch GL/XL/PL Series Rotary Position Indicators\***

The UltraSwitch series of position indicators provides a compact and economical package for both visual and remote electrical indication of valve position. Models are available in both die cast aluminum and non-metallic versions. Suitable for non-hazardous, hazardous and intrinsically-safe applications.



### **Aviator and BUSwitch Rotary Position Indicator with Internal Pilot Solenoid\***

The Aviator rotary position indicator enclosure with internal pilot solenoid coil provides a truly integrated package. It can easily be converted to a BUSwitch by simply adding a Fieldbus communication printed circuit board.



### **APEX Modular Positioner\***

Available in both aluminum and non-metallic versions, the Apex positioner combines precise valve positioning with advanced features. A modular manifold base allows 3-15 psi pneumatic control signals, or 4-20mA signals with the addition of the I/P module. Models are available for corrosion resistant applications and hazardous locations as defined by UL, C-UL, CENELEC, and SAA.



### **Lockouts\***

The lockout option permits easy lockout of automated valves. Lockouts are designed to withstand the rated output torque of the actuator, with the intent to meet the requirements of OSHA Standard 1910.47 "The Control of Hazardous Energy" (Lockout/Tagout.)



### **Gear Overrides\***

Declutchable gear overrides are options which allow local manual control of actuated valves and dampers. The gear overrides are sized for easy operation and can be combined with other control accessories.



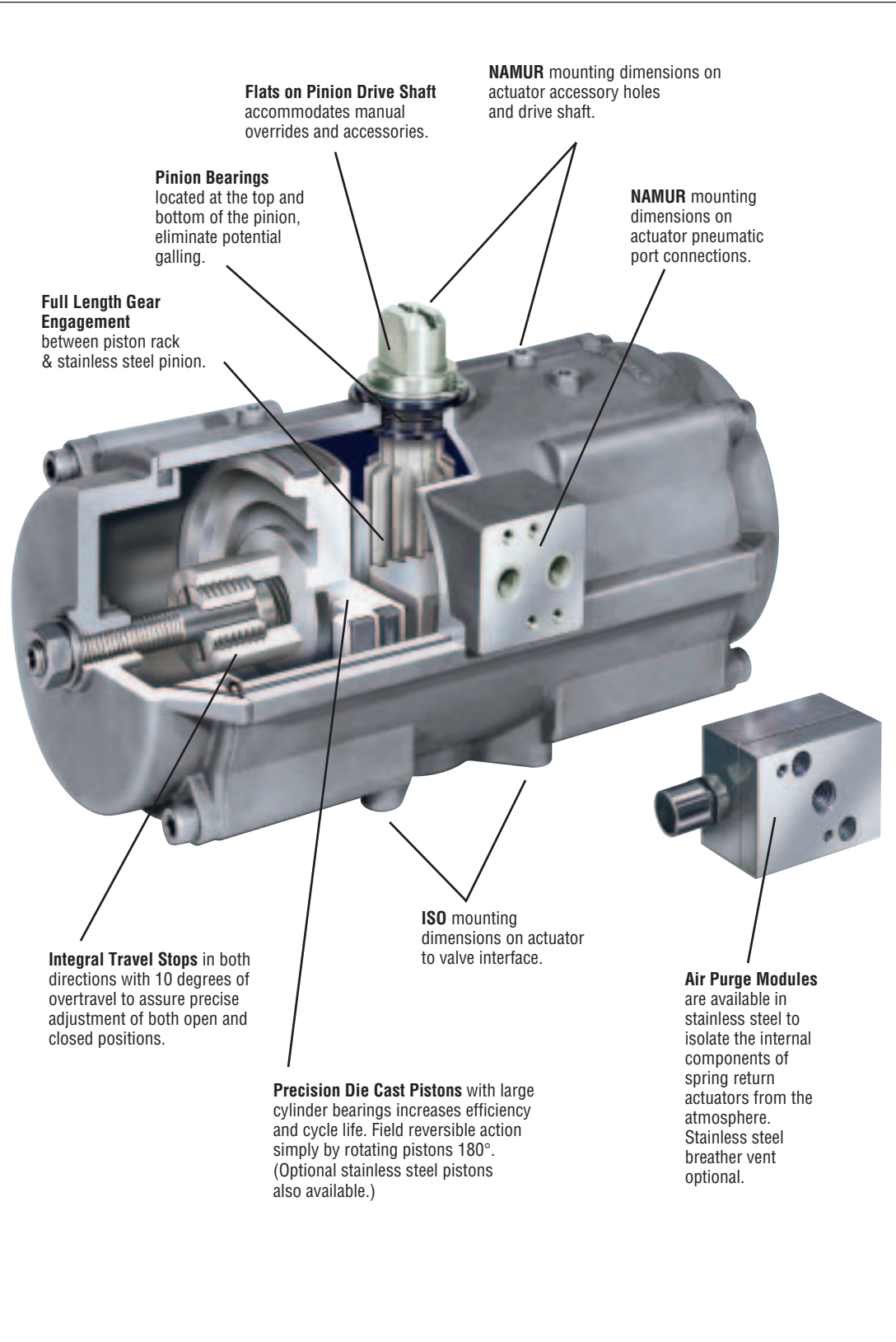
### **AutoBrakits\***

Automax heavy-duty mounting kits are designed to close tolerances to assure consistency and proper alignment, which are essential to ensure maximum actuator and valve cycle life.

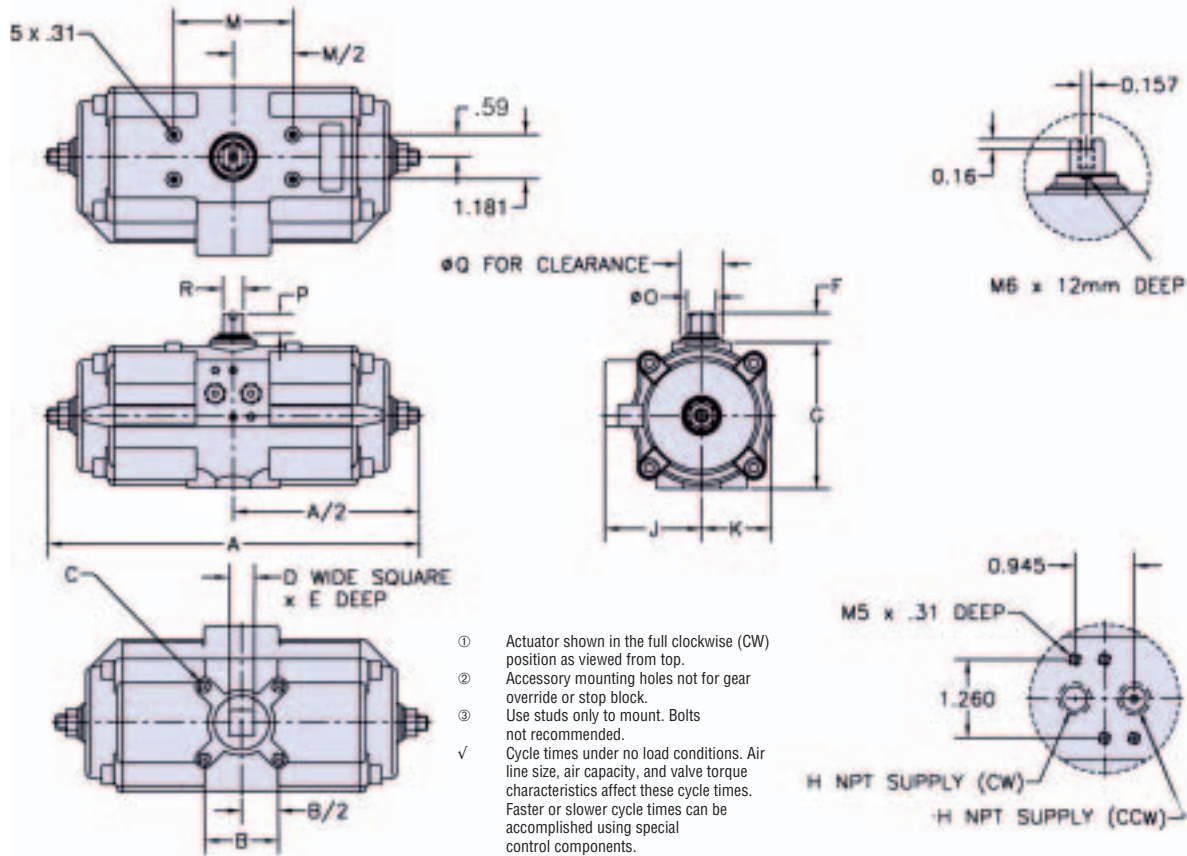
\* Consult Individual Catalogs and IOM's For Additional Information

**SXL Series Stainless Steel**

The SXL Series utilizes a 316 series stainless steel body and is ideal for use in corrosive environments. It is available in both Double Acting and Spring Return versions with a maximum double acting torque output of 7,279 in-lbs. The SXL Series can be supplied with stainless steel or aluminum pistons and springs per customer requirements and is also available with optional polished finishes for sanitary applications.



## SXL Series Dimensions



| Model  | ISO     | A     | B     | C         | D     | E    | F    | G    | H   | J    | K    | M     | O    | P   | Q    | R    | WEIGHTS |       | VOLUME |     | CYCLE TIME |     |
|--------|---------|-------|-------|-----------|-------|------|------|------|-----|------|------|-------|------|-----|------|------|---------|-------|--------|-----|------------|-----|
|        |         |       |       |           |       |      |      |      |     |      |      |       |      |     |      |      | DA      | SR    | CW     | CCW | CW         | CCW |
| SXL050 | FO4S11M | 6.69  | 1.169 | M5 x .31  | .433  | .47  | .79  | 2.56 | 1/8 | 1.85 | 1.18 | 3.150 | .56  | .39 | .83  | .39  | 4.85    | 5.15  | 8.2    | 5.4 | .5         | .5  |
| SXL063 | FO5S14M | 7.95  | 1.392 | M6 x .31  | .551  | .63  | .79  | 2.56 | 1/8 | 2.11 | 1.44 | 3.150 | .56  | .39 | .91  | .39  | 7.05    | 7.80  | 16     | 10  | .5         | .5  |
| SXL085 | FO7S17M | 9.84  | 1.949 | M8 x .31  | .669  | .79  | .79  | 3.94 | 1/8 | 2.60 | 1.87 | 3.150 | .77  | .55 | 1.18 | .55  | 11.24   | 13.18 | 34     | 20  | .5         | .5  |
| SXL100 | FO7S17M | 11.65 | 1.949 | M8 x .31  | .669  | .79  | .79  | 4.57 | 1/4 | 2.95 | 2.   | 3.150 | .77  | .55 | 1.46 | .55  | 16.09   | 19.02 | 56     | 38  | 1          | .5  |
| SXL115 | F10S22M | 13.46 | 2.840 | M10 x .31 | .866  | .98  | 1.18 | 5.16 | 1/4 | 3.23 | 2.46 | 5.118 | 1.38 | .79 | 1.77 | .79  | 23.14   | 27.55 | 94     | 65  | 1          | 1   |
| SXL125 | F10S22M | 15.83 | 2.840 | M10 x .31 | .866  | .98  | 1.18 | 6.61 | 1/4 | 3.43 | 2.70 | 5.118 | 1.38 | .79 | 2.17 | .79  | 38.14   | 45.12 | 128    | 90  | 1          | 1   |
| SXL150 | F12S27M | 19.13 | 3.480 | M12 x .47 | 1.063 | 1.14 | 1.18 | 6.61 | 1/4 | 3.94 | 3.19 | 5.118 | 1.97 | .89 | 2.64 | 1.42 | 51.14   | 61.50 | 224    | 159 | 2          | 1.5 |

### How To Order (Select Bold Type Code from each column that applies)

| Model  | Type                          | Springs (Select One) | Seals                       | Materials              | Options                          |
|--------|-------------------------------|----------------------|-----------------------------|------------------------|----------------------------------|
| SXL050 | <b>D</b> Double Acting        | <b>04</b>            | <b>Blank</b> - Viton (Std.) | <b>Blank</b>           | <b>R</b> Extra Long Travel Stop  |
| SXL063 | <b>S</b> Spring Return (FCW)  | <b>05</b>            | <b>L</b> Low Temp.          | <b>K</b> K-Mass Coated | <b>M</b> Stainless Steel Springs |
| SXL085 | <b>C</b> Spring Return (FCCW) | <b>06</b>            |                             | <b>F</b> Polished      | <b>P</b> Stainless Steel Pistons |
| SXL100 |                               | <b>07</b>            |                             |                        |                                  |
| SXL115 |                               | <b>08</b>            |                             |                        |                                  |
| SXL125 |                               | <b>09</b>            |                             |                        |                                  |
| SXL150 |                               | <b>10</b>            |                             |                        |                                  |
|        |                               | <b>11</b>            |                             |                        |                                  |
|        |                               | <b>12</b>            |                             |                        |                                  |

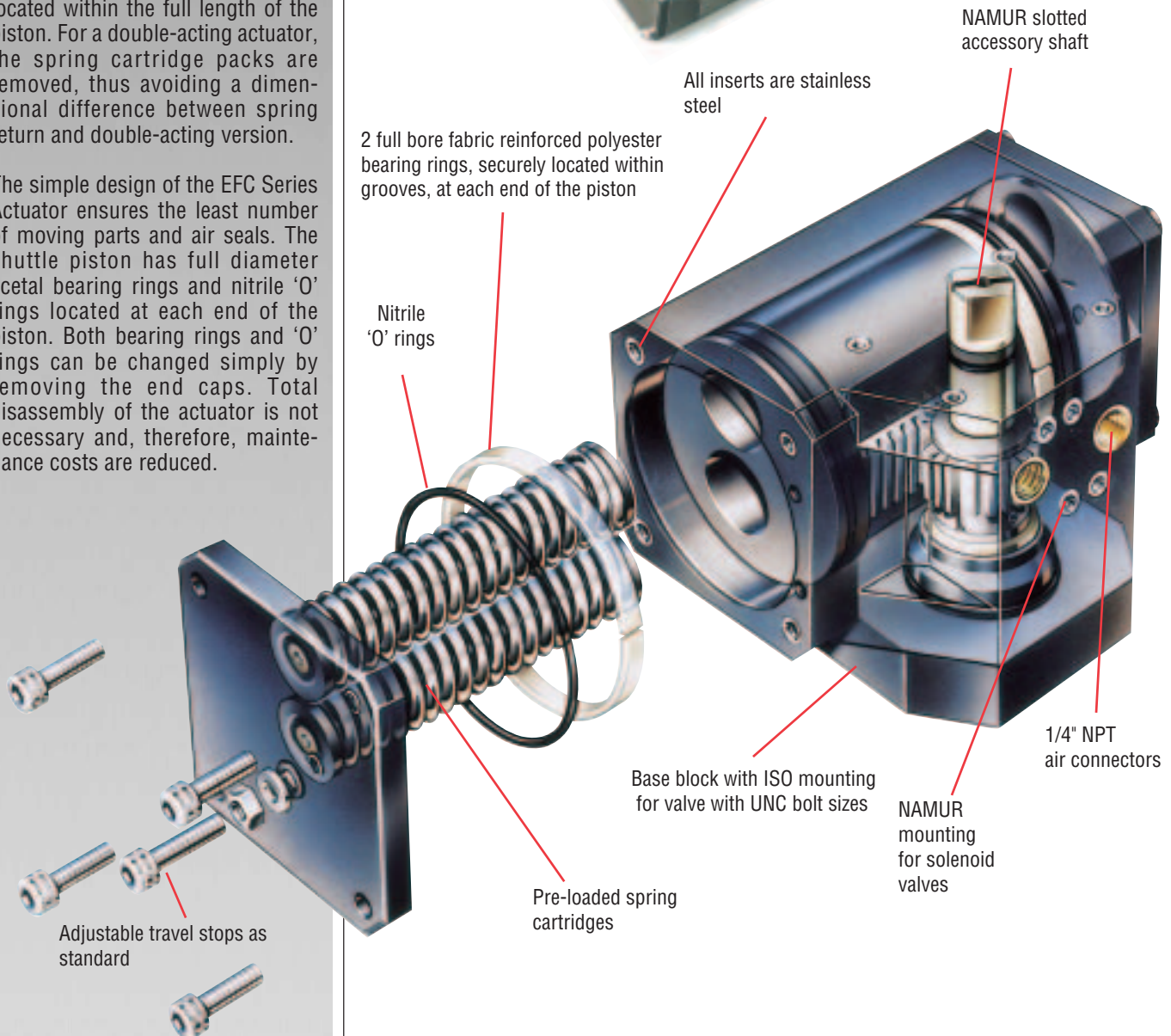
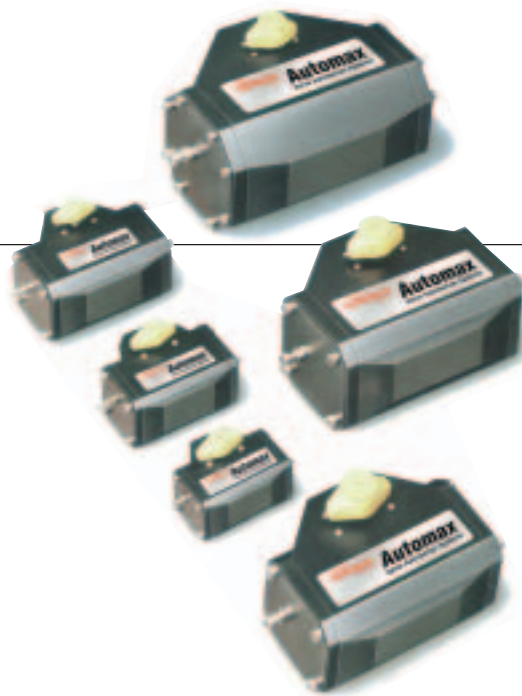
Example: A model SXL100 spring return (FCW) spring set 10, would be coded as **SXL100S10**

## EFC Series Actuators

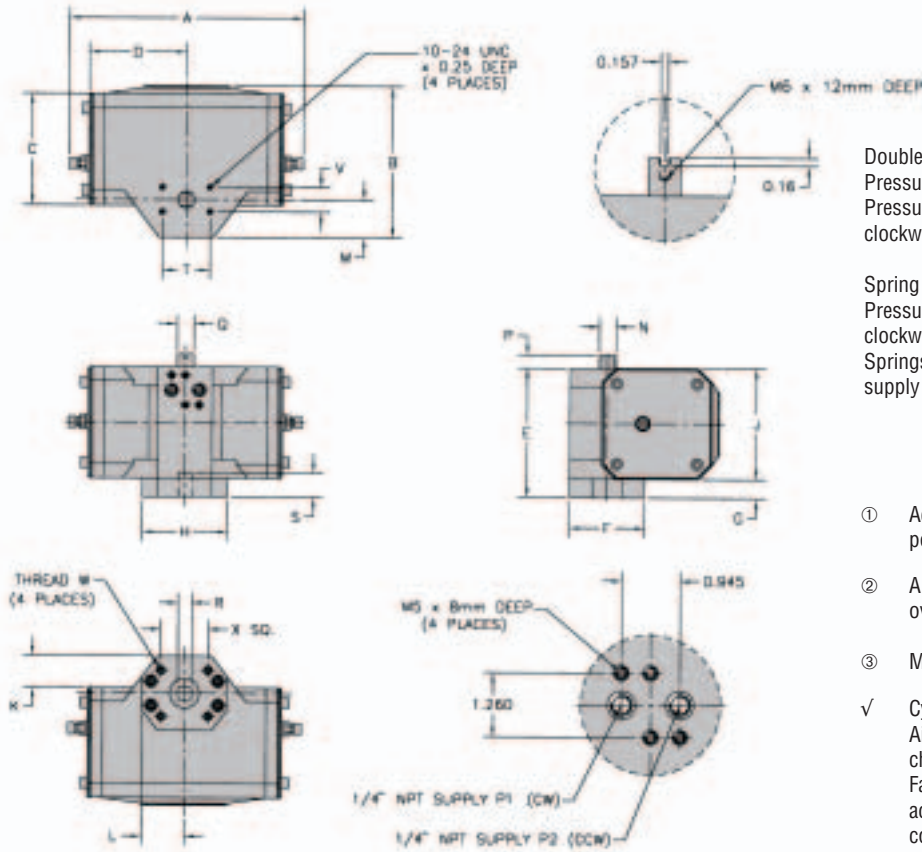
The EFC Series Actuator is manufactured from a tough corrosion-resistant epoxy and glass composite (EFC) which does not require surface protection. EFC is a tough material, which is consistent throughout, therefore any surface damage will not affect its resistance to corrosion.

The EFC Series shuttle piston design allows ample space for two low-fatigue spring cartridge packs, located within the full length of the piston. For a double-acting actuator, the spring cartridge packs are removed, thus avoiding a dimensional difference between spring return and double-acting version.

The simple design of the EFC Series Actuator ensures the least number of moving parts and air seals. The shuttle piston has full diameter acetal bearing rings and nitrile 'O' rings located at each end of the piston. Both bearing rings and 'O' rings can be changed simply by removing the end caps. Total disassembly of the actuator is not necessary and, therefore, maintenance costs are reduced.



## EFC Series Dimensions



Double Acting (as viewed from top)  
 Pressure at port "P1" will result in clockwise rotation.  
 Pressure at port "P2" will result in counter-clockwise rotation.

Spring Return (SR Unit) (as viewed from top)  
 Pressure at port "P2" will result in counter-clockwise rotation.  
 Springs provide clockwise rotation upon loss of supply pressure.

- ① Actuator shown in the full clockwise (CW) position as viewed from top.
- ② Accessory mounting holes not for gear override or stop block.
- ③ Mounting is per ISO 5211 with UNC bolt sizes.
- ✓ Cycle times under no load conditions. Air line size, air capacity, and valve torque characteristics affect these cycle time. Faster or slower cycle times can be accomplished using special control components.

| Model | ISO ③   | A     | B     | C    | D    | E    | F    | G    | H    | J    | K    | L    | M    | N DIA. | P    | Q     | R     | S    | T②    | V     | W           | X     | DA  | SR  | WEIGHT (lbs) |
|-------|---------|-------|-------|------|------|------|------|------|------|------|------|------|------|--------|------|-------|-------|------|-------|-------|-------------|-------|-----|-----|--------------|
| A20   | F04S11E | 6.82  | 4.41  | 3.15 | 2.76 | 3.70 | 2.68 | 0.71 | 2.99 | 2.95 | 1.06 | 1.50 | 1.34 | 0.69   | 0.79 | 0.472 | 0.433 | 0.47 | 1.969 | 1.024 | 1/4-20X.40  | 1.169 | 4.6 | 5.3 |              |
| A40   | F04S11E | 8.36  | 5.24  | 3.70 | 3.31 | 4.49 | 2.99 | 0.79 | 3.54 | 3.74 | 1.34 | 1.77 | 1.50 | 0.69   | 0.79 | 0.472 | 0.433 | 0.51 | 1.969 | 1.024 | 1/4-20X.40  | 1.169 | 7.9 | 9.0 |              |
| A80   | F05S14E | 9.76  | 6.30  | 4.65 | 4.02 | 5.47 | 3.15 | 0.79 | 3.54 | 4.69 | 1.42 | 1.77 | 1.58 | 0.69   | 0.79 | 0.472 | 0.551 | 1.02 | 1.969 | 1.024 | 1/4-20X.40  | 1.392 | 13  | 15  |              |
| A160  | F07S17E | 12.57 | 7.60  | 5.63 | 5.16 | 6.65 | 3.78 | 0.98 | 4.72 | 5.67 | 1.65 | 2.36 | 1.89 | 1.06   | 1.18 | 0.709 | 0.669 | 0.95 | 3.150 | 1.181 | 5/16-18X.50 | 1.948 | 22  | 26  |              |
| A270  | F10S22E | 14.73 | 8.98  | 6.65 | 5.95 | 7.80 | 4.41 | 1.10 | 5.51 | 6.65 | 1.97 | 2.76 | 2.21 | 1.25   | 1.18 | 0.866 | 0.866 | 1.14 | 3.150 | 1.181 | 3/8-16X.63  | 2.839 | 37  | 44  |              |
| A500  | F12S27E | 17.76 | 11.02 | 8.27 | 7.52 | 9.33 | 5.51 | 1.10 | 6.23 | 8.27 | 2.44 | 3.15 | 2.76 | 1.50   | 1.18 | 1.063 | 1.063 | 1.34 | 3.150 | 1.181 | 1/2-13X.78  | 3.479 | 62  | 70  |              |

### How To Order (Select Bold Type Code from each column that applies)

| Model       | CYCLE TIME (seconds per 90°) |        |
|-------------|------------------------------|--------|
|             | Air                          | Spring |
| <b>A20</b>  | 0.5                          | 0.6    |
| <b>A40</b>  | 0.6                          | 0.6    |
| <b>A80</b>  | 0.9                          | 0.6    |
| <b>A160</b> | 1.8                          | 1.2    |
| <b>A270</b> | 3.2                          | 2.0    |
| <b>A500</b> | 4.9                          | 3.3    |

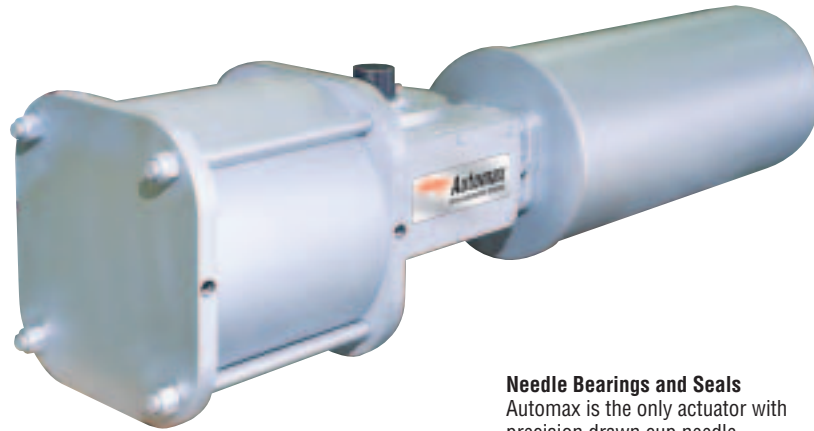
| Model       | Type                           | Springs (select one) | Seals                 |
|-------------|--------------------------------|----------------------|-----------------------|
| <b>A20</b>  | <b>DA</b> Double Acting        | <b>30</b>            | <b>Blank</b> Std Buna |
| <b>A40</b>  | <b>SR</b> Spring Return (FCW)  | <b>40</b>            |                       |
| <b>A80</b>  | <b>SO</b> Spring Return (FCCW) | <b>50</b>            |                       |
| <b>A160</b> |                                | <b>60</b>            |                       |
| <b>A270</b> |                                | <b>70</b>            |                       |
| <b>A500</b> |                                | <b>80</b>            |                       |

Example: A model A80SR spring return (FCW) spring set 60 would be coded as **A80SR60**

# Heavy Duty R2, R3 and R4 Series

Automax has a complete line of scotch yoke, heavy duty rotary actuators, which has a unique bearing design to provide higher efficiencies and longer life.

- Pneumatic, Gas and Hydraulic Models
- Double Acting, Spring Return and "Fail-Safe"
- On-Off, Multi-position and Throttling
- Pressure Ranges from 40 psi to 2500 psi
- Torque Outputs: Standard Design from 1000 to 170,000 in-lbs
- Overrides, Special Controls, Line Break Controls, etc.

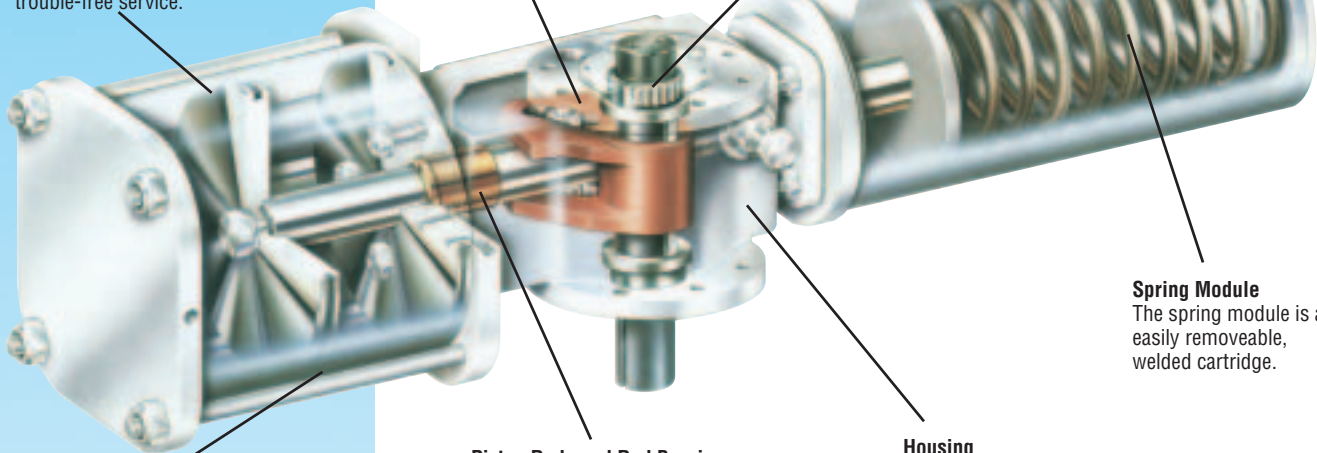


**Needle Bearings and Seals**  
Automax is the only actuator with precision drawn cup needle bearings at the torque shaft journals. The bearings significantly increase torque output and cycle life, while providing near frictionless rotary movement. The seals protect the needle bearings from external dirt and corrosion, while the bearing's rigid design prolongs seal life.

**Scotch Yoke**  
The slot in the scotch yoke mechanism is precision machined. The yoke pin is induction hardened and chrome plated. The yoke pin rollers are hardened steel.

**Piston Seals**  
The pneumatic series actuators utilize a quad seal. This seal has proven dependable in years of trouble-free service.

**Spring Module**  
The spring module is an easily removeable, welded cartridge.

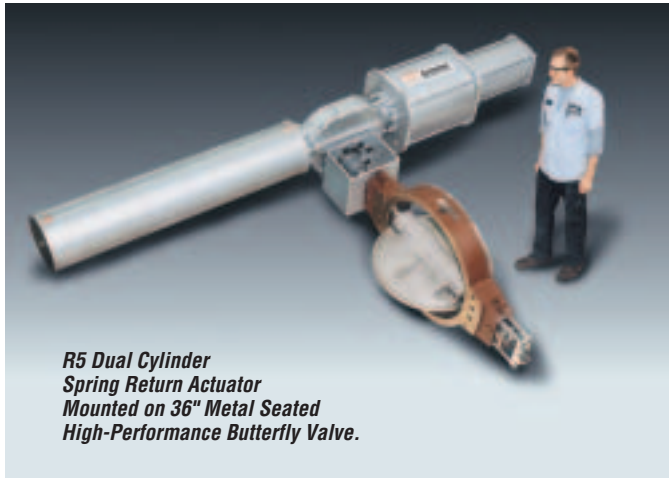


**Cylinders**  
The cylinders are honed to a micro finish with a hard chrome plating.

**Piston Rods and Rod Bearings**  
Large diameter piston rods are guided and supported by extra long bronze bearings. The rods are ground, high strength steel with a hard chrome plating polished to a mirror finish of 4 to 8 microns.

**Housing**  
This unique one-piece housing assures accurate alignment of both the torque shaft and the piston rod.

## Heavy Duty R5 Series



**R5 Dual Cylinder  
Spring Return Actuator  
Mounted on 36" Metal Seated  
High-Performance Butterfly Valve.**

The R5 Series Heavy Duty Scotch Yoke Actuator provides torque output as high as 500,000 in-lb.

- Pneumatic, Gas and Hydraulic Models
- Double Acting, Spring Return and "Fail-Safe"
- On-Off, Multi-position and Throttling
- Pressure Ranges from 40 psi to 2500 psi

The R5 series when combined with Automax's extensive range of automation products offers the opportunity to standardize on a single source for your complete quarter-turn automation needs.

### Piston Seal and Wearband

The pneumatic series actuators utilize a quad seal in conjunction with a piston wearband. The quad seal provides a low friction, long lasting seal, proven dependable for years of trouble free service. The wearband provides additional alignment and support for the piston seal.

### Scotch Yoke

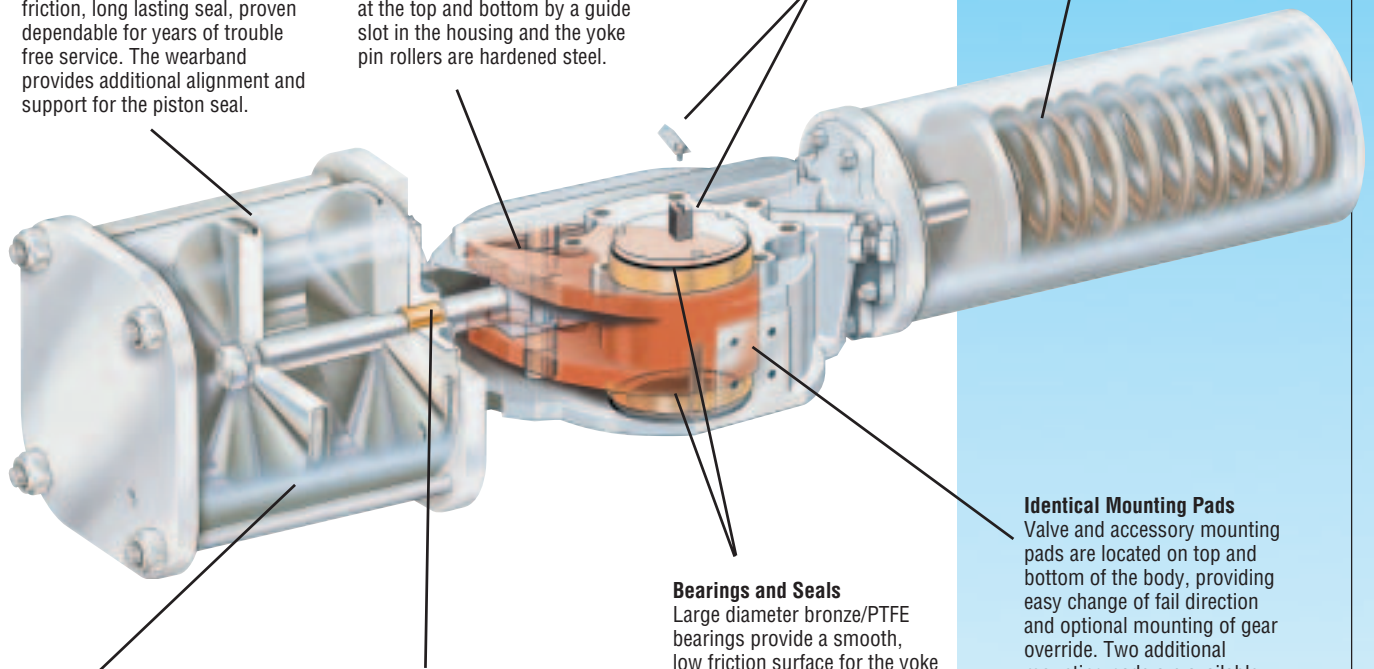
The slot in the scotch yoke mechanism is precision machined. The yoke pin is induction hardened and chrome plated. It is supported at the top and bottom by a guide slot in the housing and the yoke pin rollers are hardened steel.

### Indicator/Output shaft

Top accessory shaft has NAMUR slot, and optional position indicator.

### Spring Module

The spring module is an easily removable, welded cartridge.



### Cylinder

The cylinders are honed to a micro finish with a hard chrome plating.

### Piston Rods and Rod Bearings

Piston rods are guided and supported by self lubricating bronze bearings. The rods are ground, high strength steel with a hard chrome plating, polished to a mirror finish.

### Bearings and Seals

Large diameter bronze/PTFE bearings provide a smooth, low friction surface for the yoke journal. The seals protect the bearings from external dirt and corrosion, while the bearing's rigid design prolongs seal life.

### Identical Mounting Pads

Valve and accessory mounting pads are located on top and bottom of the body, providing easy change of fail direction and optional mounting of gear override. Two additional mounting pads are available on the side of the body for mounting accessories.

## Heavy Duty Torque Charts

### Double Acting

| Model | Torque | 40     | 60     | 80     | 100    |
|-------|--------|--------|--------|--------|--------|
| R205  | Break  | 3302   | 4953   | 6604   | 8255   |
|       | Run    | 1865   | 2798   | 3731   | 4663   |
| R206  | Break  | 4899   | 7348   | 9797   | 12246  |
|       | Run    | 2767   | 4151   | 5535   | 6918   |
| R207  | Break  | 6785   | 10178  | 13571  | 16963  |
|       | Run    | 3833   | 5750   | 7667   | 9583   |
| R208  | Break  | 8962   | 13444  | 17925  | NA     |
|       | Run    | 5063   | 7595   | 10126  |        |
| R310  | Break  | 13607  | 20411  | 27214  | 34018  |
|       | Run    | 7687   | 11531  | 15374  | 19218  |
| R312  | Break  | 19993  | 29990  | 39990  | 49985  |
|       | Run    | 11295  | 16940  | 22590  | 28240  |
| R314  | Break  | 27541  | 41310  | 55080  | NA     |
|       | Run    | 15560  | 23340  | 31120  |        |
| R316  | Break  | 36250  | 54375  | NA     | NA     |
|       | Run    | 20480  | 30720  |        |        |
| R414  | Break  | 40005  | 60010  | 80010  | 100010 |
|       | Run    | 22600  | 33900  | 45200  | 56500  |
| R416  | Break  | 53070  | 79600  | 106135 | 132670 |
|       | Run    | 29980  | 44970  | 59960  | 74950  |
| R418  | Break  | 67870  | 101810 | 135745 | 169680 |
|       | Run    | 38343  | 57515  | 76685  | 95860  |
| R420  | Break  | 84420  | 126630 | 168835 | NA     |
|       | Run    | 47690  | 71540  | 95380  |        |
| R422  | Break  | 102706 | 154059 | NA     | NA     |
|       | Run    | 58022  | 87033  |        |        |

### Spring Return

| Model  | Torque          | 40    | 60     | 80     | 100    |
|--------|-----------------|-------|--------|--------|--------|
| R205SR | Pneumatic Break | 2297  | 3447   | 4594   | 5668   |
|        | Pneumatic End   | 1244  | 1922   | 2474   | 2954   |
|        | Spring Break    | 2291  | 3379   | 4595   | 5882   |
|        | Spring End      | 1237  | 1854   | 2475   | 3168   |
| R206SR | Pneumatic Break | 3235  | 4961   | 6543   | 8268   |
|        | Pneumatic End   | 1710  | 2842   | 3829   | 4197   |
|        | Spring Break    | 3379  | 4793   | 6349   | 8527   |
|        | Spring End      | 1854  | 2673   | 3636   | 4455   |
| R207SR | Pneumatic Break | 4452  | 6755   | 9003   | 10987  |
|        | Pneumatic End   | 2333  | 4041   | 4932   | 5560   |
|        | Spring Break    | 4595  | 6349   | 8923   | 11759  |
|        | Spring End      | 2475  | 3636   | 4851   | 6331   |
| R208SR | Pneumatic Break | 5880  | 8721   | 11764  | 14704  |
|        | Pneumatic End   | 3166  | 4649   | 6337   | 7927   |
|        | Spring Break    | 5882  | 8923   | 11759  | 14692  |
|        | Spring End      | 3168  | 4851   | 6331   | 7915   |
| R310SR | Pneumatic Break | 9187  | 13785  | 18379  | 22824  |
|        | Pneumatic End   | 4958  | 7683   | 9226   | 10350  |
|        | Spring Break    | 9189  | 13522  | 19049  | 24993  |
|        | Spring End      | 4950  | 7420   | 9895   | 12519  |
| R312SR | Pneumatic Break | 12937 | 19849  | 26167  | 33083  |
|        | Pneumatic End   | 6835  | 10696  | 13693  | 16451  |
|        | Spring Break    | 13522 | 19841  | 27022  | 34443  |
|        | Spring End      | 7420  | 10687  | 14548  | 17811  |
| R314SR | Pneumatic Break | 17813 | 27015  | 36023  | 43937  |
|        | Pneumatic End   | 8660  | 14541  | 19391  | 22229  |
|        | Spring Break    | 19049 | 27022  | 36027  | 47043  |
|        | Spring End      | 9895  | 14548  | 19395  | 25335  |
| R316SR | Pneumatic Break | 23672 | 34892  | 47047  | NA     |
|        | Pneumatic End   | 11198 | 18260  | 25339  |        |
|        | Spring Break    | 24993 | 36027  | 47043  |        |
|        | Spring End      | 12519 | 19395  | 25335  |        |
| R414SR | Pneumatic Break | 27017 | 40522  | 54034  | 65906  |
|        | Pneumatic End   | 14563 | 21811  | 29613  | 34984  |
|        | Spring Break    | 27000 | 40534  | 53514  | 68924  |
|        | Spring End      | 14546 | 21823  | 29092  | 38002  |
| R416SR | Pneumatic Break | 35285 | 52338  | 70571  | 87623  |
|        | Pneumatic End   | 16574 | 27916  | 39649  | 46374  |
|        | Spring Break    | 37712 | 53514  | 68924  | 89343  |
|        | Spring End      | 19001 | 29092  | 38002  | 48094  |
| R418SR | Pneumatic Break | 44656 | 65057  | 89320  | 111651 |
|        | Pneumatic End   | 20235 | 34036  | 48070  | 60743  |
|        | Spring Break    | 48472 | 68924  | 89343  | 111024 |
|        | Spring End      | 24050 | 38002  | 488094 | 60115  |
| R420SR | Pneumatic Break | 55731 | 82705  | 109531 | 137834 |
|        | Pneumatic End   | 31309 | 41456  | 58622  | 74229  |
|        | Spring Break    | 53514 | 85779  | 111024 | 137828 |
|        | Spring End      | 29092 | 44530  | 60115  | 74223  |
| R422SR | Pneumatic Break | 64633 | 101472 | 131049 | NA     |
|        | Pneumatic End   | 33712 | 50564  | 67443  |        |
|        | Spring Break    | 68924 | 103390 | 137828 |        |
|        | Spring End      | 38002 | 52481  | 74223  |        |

## Heavy Duty Torque Charts

| R5 Pneumatic Double Acting Torques |                 |        |        |        |        | R5 Pneumatic Spring Return Torques |                 |        |        |        |        |
|------------------------------------|-----------------|--------|--------|--------|--------|------------------------------------|-----------------|--------|--------|--------|--------|
| Model                              | Torque          | 40     | 60     | 80     | 100    | Model                              | Torque          | 40     | 60     | 80     | 100    |
| R514DA                             | Break           | 73978  | 110967 | 147956 | 184945 | R516SR                             | Pneumatic Break | NA     | NA     | NA     | 156005 |
|                                    | Run             | 44083  | 66124  | 88166  | 110207 |                                    | Pneumatic End   |        |        |        | 85871  |
| R516DA                             | Break           | 97370  | 146056 | 194741 | 243426 | Spring Break                       | 148061          |        |        |        |        |
|                                    | Run             | 58022  | 87033  | 116044 | 145055 | Spring End                         | 88837           |        |        |        |        |
| R518DA                             | Break           | 123882 | 185822 | 247763 | 309704 | R518SR                             | Pneumatic Break | 82154  | 119224 | 159124 | 200290 |
|                                    | Run             | 73820  | 110730 | 147640 | 184550 |                                    | Pneumatic End   | 39519  | 66535  | 88990  | 113660 |
| R51414DA                           | Break           | 150393 | 225589 | 300786 | 375982 | Spring Break                       | 78533           | 111234 | 148061 | 182885 | 182885 |
|                                    | Run             | 89618  | 134426 | 179235 | 224044 | Spring End                         | 41956           | 66740  | 88837  | 109731 | 109731 |
| R520DA                             | Break           | 153512 | 230268 | 307024 | 383780 | R520SR                             | Pneumatic Break | 98195  | 149578 | 196391 | 250315 |
|                                    | Run             | 91476  | 137214 | 182952 | 228691 |                                    | Pneumatic End   | 54881  | 79902  | 109761 | 145647 |
| R51614DA                           | Break           | 173785 | 260678 | 347570 | 434463 | Spring Break                       | 91442           | 139352 | 182885 | 220965 | 220965 |
|                                    | Run             | 103557 | 155335 | 207114 | 258892 | Spring End                         | 54865           | 80127  | 109731 | 132579 | 132579 |
| R522DA                             | Break           | 186261 | 279392 | 372522 | 465653 | R522SR                             | Pneumatic Break | 118445 | 189534 | 237839 | 304023 |
|                                    | Run             | 110991 | 166487 | 221982 | 277478 |                                    | Pneumatic End   | 65755  | 119400 | 133171 | 178232 |
| R51616DA                           | Break           | 197177 | 295766 | 394355 | 492944 | Spring Break                       | 111234          | 148061 | 220965 | 265558 | 265558 |
|                                    | Run             | 117496 | 176244 | 234992 | 293740 | Spring End                         | 66740           | 88837  | 132579 | 159335 | 159335 |
| R524DA                             | Break           | 222129 | 333194 | 444258 | NA     | R524SR                             | Pneumatic Break | 140221 | 221343 | 281411 | 364896 |
|                                    | Run             | 132365 | 198547 | 264729 | NA     |                                    | Pneumatic End   | 70545  | 134713 | 155620 | 217507 |
| R51816DA                           | Break           | 223689 | 335533 | 447377 | NA     | Spring Break                       | 139352          | 182885 | 265558 | 311154 | 311154 |
|                                    | Run             | 133294 | 199941 | 266588 | NA     | Spring End                         | 80127           | 109731 | 159335 | 186693 | 186693 |
| R51818DA                           | Break           | 250200 | 375300 | 500400 | NA     | R52214SR                           | Pneumatic Break | 171600 | 258112 | 333706 | 438098 |
|                                    | Run             | 149092 | 223638 | 298183 | NA     |                                    | Pneumatic End   | 101466 | 153445 | 186318 | 269586 |
| R52020DA                           | Break           | 309460 | 464191 | NA     | NA     | Spring Break                       | 148061          | 220965 | 311154 | 355748 | 355748 |
|                                    | Run             | 184404 | 276607 | NA     | NA     | Spring End                         | 88837           | 132579 | 186693 | 213449 | 213449 |
| R52416SR                           | Pneumatic Break | 208867 | 318838 | 424063 | NA     | R52416SR                           | Pneumatic Break | 208867 | 318838 | 424063 | NA     |
|                                    | Pneumatic End   | 122237 | 193047 | 255551 |        |                                    | Pneumatic End   | 122237 | 193047 | 255551 |        |
|                                    | Spring Break    | 182885 | 265558 | 355748 |        |                                    | Spring Break    | 182885 | 265558 | 355748 |        |
|                                    | Spring End      | 109731 | 159335 | 213449 |        |                                    | Spring End      | 109731 | 159335 | 213449 |        |

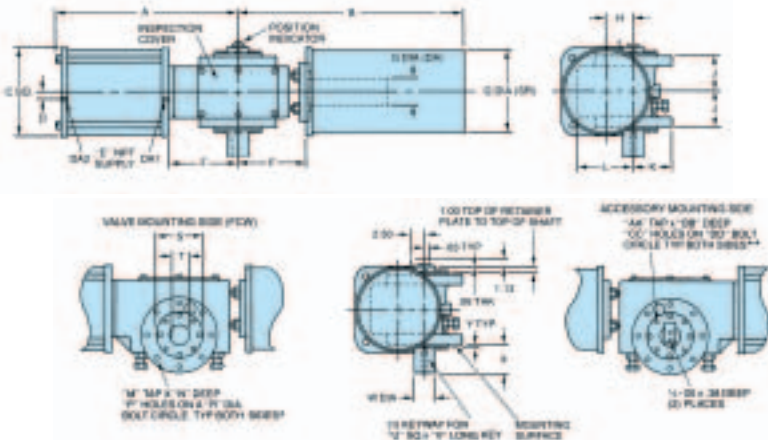
### How To Order *(Select Bold Type Code from each column that applies)*

| Model     | Cylinder Size  | Type                          | Spring Size                    | Override                                     | Temperature   | Material/Coating   |
|-----------|--|-------------------------------|--------------------------------|--|---|--|
| <b>R2</b> | 05-5" dia.<br>06-6" dia.<br>07-7" dia.<br>08-8" dia.                                   | <b>DA</b> -Double Acting      | <b>Blank</b> - DA              | <b>Blank</b> -None                           | <b>Blank</b> - Standard 20°-180° F (nitrile seals).<br><b>V</b> - High Temp. 0° to 300° F (viton seals).<br><b>L</b> - Low Temp. -55° to 180°F (nitrile seals, heat treated body) | <b>Blank</b> Standard; Epoxy undercoat with Polyurethane top coat<br><b>F</b> -AWWA, specifications intent<br><b>E</b> - Epoxy paint (white)<br><b>M</b> - Marine Trim |
|           |  | <b>SR</b> -Spring Return FCW  | <b>40</b> -40 psi air supply   | <b>G</b> -Declutch Gear                      |   |  |
| <b>R3</b> | 10-10" dia.<br>12-12" dia.<br>14-14" dia.<br>16-16" dia.                               | <b>SO</b> -Spring Return FCCW | <b>60</b> -60 psi air supply   | <b>H</b> - Hydraulic                         |   |  |
|           |  |                               | <b>80</b> -80 psi air supply   | <b>J</b> - Jackscrew                         |   |  |
| <b>R4</b> | 14-14" dia.<br>16-16" dia.<br>18-18" dia.<br>20-20" dia.<br>22-22" dia.                |                               | <b>100</b> -100 psi air supply | <b>S</b> - Hydraulic Snubber                 |   |  |
|           |  |                               |                                | <b>B</b> - Delutch Gear w/ Hydraulic Snubber |   |  |
| <b>R5</b> | 14-14" dia.<br>16-16" dia.<br>18-18" dia.<br>20-20" dia.<br>22-22" dia.<br>24-24" dia. |                               |                                |  |   |  |
|           |  |                               |                                |  |   |  |

Example: A model R310 spring return (FCW) with 60 psi air supply and viton seals would be: **R310SR60V**

For hydraulic or electro-hydraulic actuators, consult factory.

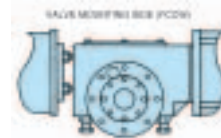
Note: In some instances for the R5 actuator, a second cylinder size is required to complete the model number. Consult torque charts.



Notes:

1. All dimensions are in inches.
2. Pressure at port side DA1 will result in clockwise rotation, pressure at port DA2 will result in counterclockwise rotation.
3. Orientation of accessory output may be indexed 90°.

- \* R2 Has only 4 holes at 45°
- \*\*R4 8 each 3/8 - 16x 3/4" deep holes on center line of "DD" diameter bolt circle are available for accessory mounting. The 3/8-16 x 1" long hex head cap screws must be replaced by a longer bolt equal to the thickness of the mounting bracket. The retainer plate is 1/2" thick.
- \*\*R2-R3 A clearance hole for a 5/16" hex cap screw and lock-washer may be required to clear the retainer plate bolts on the center line of "DD" diameter bolt circle.



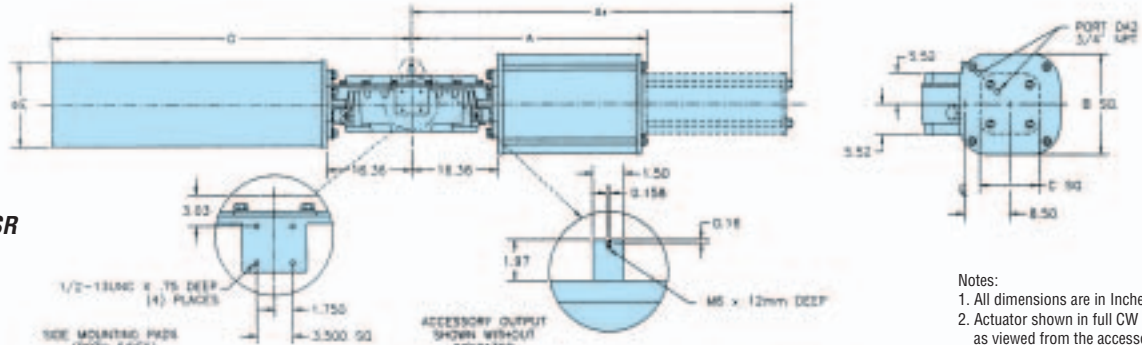
| Model | A     | B     |       |       |       |       | C     | D    | E   | F     | G    |       |       |       |       | H    | J    | K    | L    |
|-------|-------|-------|-------|-------|-------|-------|-------|------|-----|-------|------|-------|-------|-------|-------|------|------|------|------|
|       |       | DA    | SR40  | SR60  | SR80  | SR100 |       |      |     |       | DA   | SR40  | SR60  | SR80  | SR100 |      |      |      |      |
| R205  | 19.82 | 17.01 | 29.00 | 30.00 | 32.00 | 33.00 | 5.75  | 1.19 | 1/4 | 7.19  | 2.00 | 9.13  | 9.13  | 9.13  | 9.13  | 3.00 | 3.25 | 2.78 | 5.75 |
| R206  | 19.82 | 17.01 | 30.00 | 30.00 | 32.00 | 38.00 | 6.75  | 1.19 | 1/4 | 7.19  | 2.00 | 9.13  | 9.13  | 9.13  | 9.13  | 3.00 | 3.25 | 2.78 | 5.75 |
| R207  | 19.82 | 17.01 | 30.00 | 32.00 | 38.00 | 40.00 | 7.75  | 1.19 | 1/4 | 7.19  | 2.00 | 9.13  | 9.13  | 9.13  | 9.13  | 3.00 | 3.25 | 2.78 | 5.75 |
| R208  | 19.82 | 17.01 | 33.00 | 38.00 | 40.00 | 41.00 | 8.75  | 1.19 | 1/4 | 7.19  | 2.00 | 9.13  | 9.13  | 9.13  | 9.13  | 3.00 | 3.25 | 2.78 | 5.75 |
| R310  | 23.00 | 18.13 | 34.00 | 36.00 | 39.00 | 42.00 | 10.75 | 0.00 | 3/8 | 8.19  | 3.50 | 13.25 | 13.25 | 13.25 | 13.25 | 3.00 | 4.13 | 4.44 | 6.81 |
| R312  | 23.00 | 18.13 | 36.00 | 38.00 | 41.00 | 43.00 | 12.75 | 0.00 | 3/8 | 8.19  | 3.50 | 13.25 | 13.25 | 13.25 | 13.25 | 3.00 | 4.13 | 4.44 | 6.81 |
| R314  | 23.50 | 18.13 | 39.00 | 41.00 | 44.00 | 45.00 | 14.75 | 0.00 | 1/2 | 8.19  | 3.50 | 13.25 | 13.25 | 13.25 | 14.63 | 3.00 | 4.13 | 4.44 | 6.81 |
| R316  | 23.75 | 18.13 | 42.00 | 44.00 | 45.00 | N/A   | 16.88 | 0.00 | 1/2 | 8.19  | 3.50 | 13.25 | 13.25 | 14.63 | N/A   | 3.00 | 4.13 | 4.44 | 6.81 |
| R414  | 30.87 | 25.37 | 50.00 | 56.00 | 59.00 | 55.00 | 14.75 | 0.00 | 1/2 | 11.56 | 4.50 | 14.63 | 14.63 | 14.63 | 16.63 | 4.50 | 5.82 | 6.50 | 9.75 |
| R416  | 31.12 | 25.37 | 57.00 | 59.00 | 55.00 | 56.00 | 16.88 | 0.00 | 1/2 | 11.56 | 4.50 | 14.63 | 14.63 | 16.63 | 16.63 | 4.50 | 5.82 | 6.50 | 9.75 |
| R418  | 31.69 | 25.37 | 59.00 | 56.00 | 57.00 | 59.00 | 20.88 | 0.00 | 3/4 | 11.56 | 4.50 | 16.63 | 16.63 | 16.63 | 16.63 | 4.50 | 5.82 | 6.50 | 9.75 |
| R420  | 31.94 | 25.37 | 59.00 | 56.00 | 57.00 | 59.00 | 20.88 | 0.00 | 3/4 | 11.56 | 4.50 | 16.63 | 16.63 | 16.63 | 16.63 | 4.50 | 5.82 | 6.50 | 9.75 |
| R422  | 32.12 | 25.37 | 55.00 | 58.00 | 59.00 | N/A   | 23.75 | 0.00 | 3/4 | 11.56 | 4.50 | 16.63 | 16.63 | 16.63 | N/A   | 4.50 | 5.82 | 6.50 | 9.75 |

| Model | M      | N    | P | R      | S    | T     | U    | V    | W     | X    | Y   | AA     | BB  | CC | DD    |
|-------|--------|------|---|--------|------|-------|------|------|-------|------|-----|--------|-----|----|-------|
| R2    | 5/8-11 | 1.00 | 4 | 5.750  | 4.25 | 1.718 | .500 | 1.59 | 2.000 | 2.25 | .31 | 1/4-20 | .31 | 4  | 3.562 |
| R3    | 5/8-11 | 1.13 | 8 | 7.500  | 5.00 | 2.148 | .625 | 3.50 | 2.500 | 4.25 | .31 | 1/4-20 | .31 | 4  | 4.375 |
| R4    | 7/8-9  | 1.13 | 8 | 11.000 | 8.00 | 3.261 | .875 | 4.06 | 3.750 | 5.00 | .50 | 3/8-16 | **  | 8  | 7.187 |

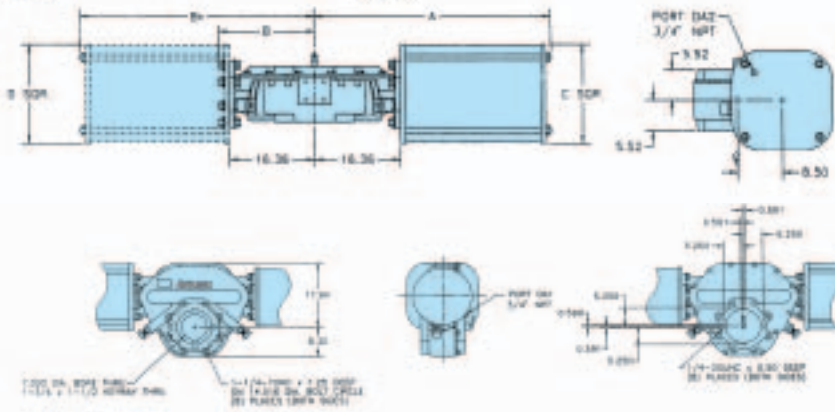
**VOLUMES & WEIGHTS** Double Acting & Spring Returns

| Model Number | Volumes In <sup>3</sup> | Estimated Weights (lbs.) |      |      |      |       |
|--------------|-------------------------|--------------------------|------|------|------|-------|
|              |                         | DA                       | SR40 | SR60 | SR80 | SR100 |
| R205         | 137                     | 124                      | 186  | 189  | 193  | 198   |
| R206         | 198                     | 133                      | 198  | 202  | 205  | 222   |
| R207         | 269                     | 144                      | 213  | 218  | 233  | 238   |
| R208         | 352                     | 155                      | 227  | 244  | 248  | 256   |
| R310         | 550                     | 290                      | 423  | 435  | 448  | 465   |
| R312         | 792                     | 339                      | 484  | 496  | 514  | 531   |
| R314         | 1078                    | 401                      | 560  | 576  | 593  | 665   |
| R316         | 1407                    | 486                      | 661  | 678  | 749  | NA    |
| R414         | 1539                    | 665                      | 904  | 941  | 968  | 1127  |
| R416         | 2010                    | 765                      | 1039 | 1067 | 1226 | 1169  |
| R418         | 2544                    | 901                      | 1203 | 1362 | 1305 | 1423  |
| R420         | 3141                    | 1038                     | 1507 | 1443 | 1559 | 1578  |
| R422         | 3801                    | 1347                     | 1816 | 1869 | 1887 | NA    |

**R5SR**



**R5DA**



Valve Mounting

Accessory

Notes:

1. All dimensions are in Inches.
2. Actuator shown in full CW position, as viewed from the accessory side.
3. Pressure at port side DA1 will result in clockwise rotation, pressure at port DA2 will result in counterclockwise rotation.
4. Orientation of accessory output may be indexed 90°.

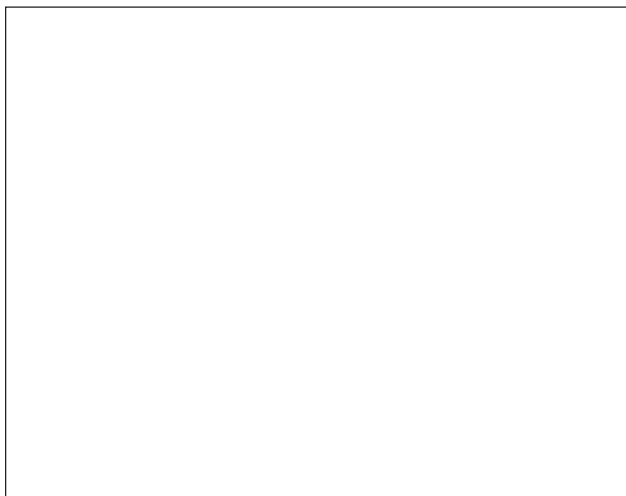
| Actuator | A     | B     | B*    | C     | D     |
|----------|-------|-------|-------|-------|-------|
| R514DA   | 44.17 | 17.46 | N/A   | 14.75 | N/A   |
| R51414DA | 44.17 | N/A   | 44.17 | 14.75 | 14.75 |
| R516DA   | 44.67 | 17.46 | N/A   | 16.88 | N/A   |
| R51614DA | 44.67 | N/A   | 44.17 | 16.88 | 14.75 |
| R51616DA | 44.67 | N/A   | 44.67 | 16.88 | 16.88 |
| R518DA   | 45.00 | 17.46 | N/A   | 18.88 | N/A   |
| R51816DA | 45.00 | N/A   | 44.67 | 18.88 | 16.88 |
| R51818DA | 45.00 | N/A   | 40.00 | 18.88 | 18.88 |
| R520DA   | 45.13 | 17.46 | N/A   | 20.88 | N/A   |
| R52020DA | 45.13 | N/A   | 45.13 | 20.88 | 20.88 |
| R522DA   | 45.50 | 17.46 | N/A   | 23.13 | N/A   |
| R524DA   | 46.00 | 17.46 | N/A   | 25.50 | N/A   |

| Actuator Model | Volume (in <sup>3</sup> ) | Weights (lb.) |      |      |      |       |
|----------------|---------------------------|---------------|------|------|------|-------|
|                |                           | DA            | SR40 | SR60 | SR80 | SR100 |
| R514           | 3233                      | 932           | N/A  | N/A  | N/A  | N/A   |
| R51414         | 6466                      | 1199          | N/A  | N/A  | N/A  | N/A   |
| R516           | 4222                      | 1066          | N/A  | N/A  | N/A  | 2040  |
| R51614         | 7455                      | 1333          | N/A  | N/A  | N/A  | N/A   |
| R51616         | 8444                      | 1467          | N/A  | N/A  | N/A  | N/A   |
| R518           | 5344                      | 1180          | 1938 | 1992 | 2153 | 2260  |
| R51816         | 9566                      | 1581          | N/A  | N/A  | N/A  | N/A   |
| R51818         | 10688                     | 1695          | N/A  | N/A  | N/A  | N/A   |
| R520           | 6597                      | 1297          | 2035 | 2253 | 2378 | 2559  |
| R52020         | 13194                     | 1929          | N/A  | N/A  | N/A  | N/A   |
| R522           | 7983                      | 1463          | 2276 | 2437 | 2725 | 2888  |
| R52214         | 11216                     | N/A           | 2704 | 2992 | 3274 | 3437  |
| R524           | 9500                      | 1730          | 2686 | 2811 | 3155 | 3274  |
| R52416         | 13722                     | N/A           | 3212 | 3556 | 3838 | N/A   |

| Actuator | A     | A*    | B     | C     | D     |       |       |       |       |       |       | E     |       |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|          |       |       |       |       | 40    | 60    | 80    | 100   | 125   | 150   | 175   |       | 200   |
| R516SR   | 44.75 | N/A   | 16.88 | N/A   | N/A   | N/A   | N/A   | 79.00 | 84.00 | 96.49 | 96.49 | 96.49 | 16.00 |
| R518SR   | 45.00 | N/A   | 18.88 | N/A   | 76.00 | 71.50 | 79.00 | 84.00 | 96.49 | 96.49 | 96.49 | 96.49 | 16.00 |
| R520SR   | 45.13 | N/A   | 20.88 | N/A   | 70.00 | 81.50 | 84.00 | 96.49 | 96.49 | 96.49 | 96.49 | N/A   | 16.00 |
| R522SR   | 45.50 | N/A   | 23.13 | N/A   | 71.50 | 79.00 | 96.49 | 96.49 | 96.49 | 96.49 | N/A   | N/A   | 16.00 |
| R524SR   | 46.00 | N/A   | 25.50 | N/A   | 81.50 | 84.00 | 96.49 | 96.49 | 96.49 | N/A   | N/A   | N/A   | 16.00 |
| R52214SR | 45.50 | 71.88 | 23.13 | 14.75 | 79.00 | 96.49 | 96.49 | 96.9  | N/A   | N/A   | N/A   | N/A   | 16.00 |
| R52416SR | 46.00 | 72.88 | 25.50 | 16.88 | 84.00 | 96.49 | 96.49 | N/A   | N/A   | N/A   | N/A   | N/A   | 16.00 |

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