

How to Order

| 10 Actuator Sizes | E Special Services | 39 Series | S Operating Mode | W Solenoid | Z Limit Switches | 120A Solenoid Voltage | Options |
|--|---|--------------|---|---|--|--|---|
| 05 10 15 20 25 30 33 35 40 42 45 50 | Blank - None - (Male Shaft End) F - Female Shaft End (0539 Only) 9 - Fail-Open Mount H - High Temperature (N and SN models only) E - End-Mounted Limit Switch Module R - Rotary Switch† T - Travel Stops† (Sizes 10–30 only) L - Low Temperature** | 39 | Blank - Double-Acting S - Spring-Return* | Blank - General Purpose Solenoid (TYPE 1) W - Watertight Solenoid (TYPE 4) X - Hazardous Locations Solenoid (TYPE 4, 4x, 7 & 9) N - No Solenoid (No Block) | Top-Mounted M1 - General Purpose Switch M2 - Two General Purpose Switches W1 - Watertight Switch W2 - Two Watertight Switches X1 - Hazardous Locations Switch X2 - Two Hazardous Location Switches Rotary - (must specify "R" in Special Services Column)† M1 - 1 SPDT M2 - 2 SPDT D1 - 1 DPDT D2 - 2 DPDT End-Mounted - (must specify "E" in Special Service Column)† Z - Watertight/Hazardous Locations, SPDT Switches ZD - Watertight/Hazardous Locations, DPDT Switches Z1 - Watertight/Hazardous Locations, 2-wire AC Proximity Switches Z3 - Watertight/Hazardous Locations, 3-wire DC Proximity Switches | 12D - 12 DC 24D - 24 DC 24A - 24/60 AC 120A - 120/60 AC 240A - 240/60 AC | V-54 - S.S. Springs (Sizes 10–30 only) V-55 - Rebreather Gasket V-64 - Namur Solenoid End Cap |

Code depicts Series 39 Spring-Return Actuator with watertight solenoid and watertight/hazardous locations end-mounted limit switches.

† Not available on Series 0539.

Due to continuous development of our product range, we reserve the right to alter the product specifications contained in this brochure as required.

*NOTE: Specify air supply for spring-return actuators. Place appropriate code from below after Solenoid voltage when ordering.

4 - Prepared for 40 psi air supply

5 - " 50 "

6 - " 60 "

7 - " 70 "

Blank " 80 "

**NOTE: Must have N (no solenoid) in Solenoid option column.



To Order ACCESS combined pneumatic actuator, limit switches and solenoid, refer to the ACCESS Brochure.

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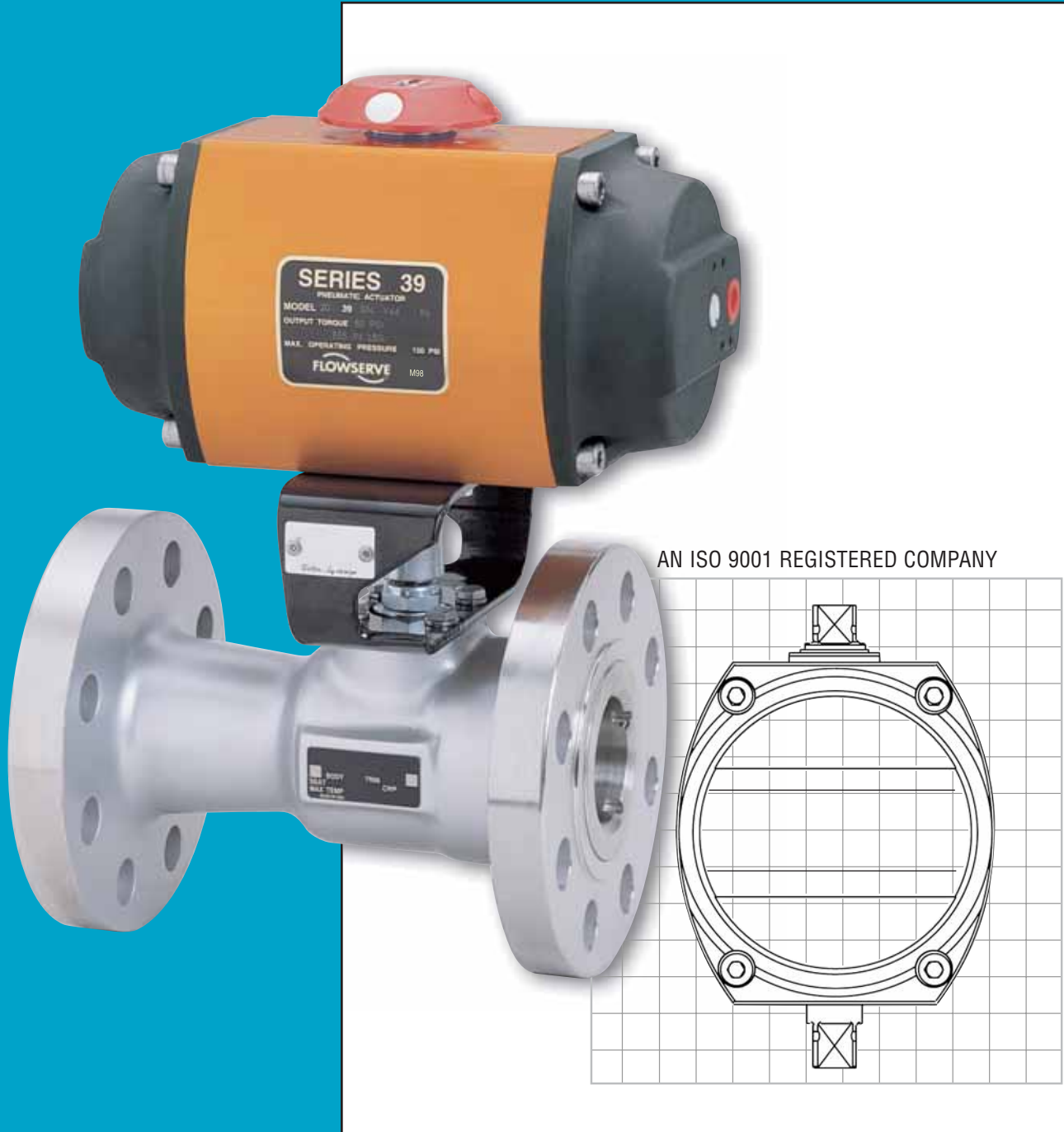
Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can (and often does) provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of Flowserve products. The purchaser/user should read and understand the Installation Operation Maintenance (IOM) instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.

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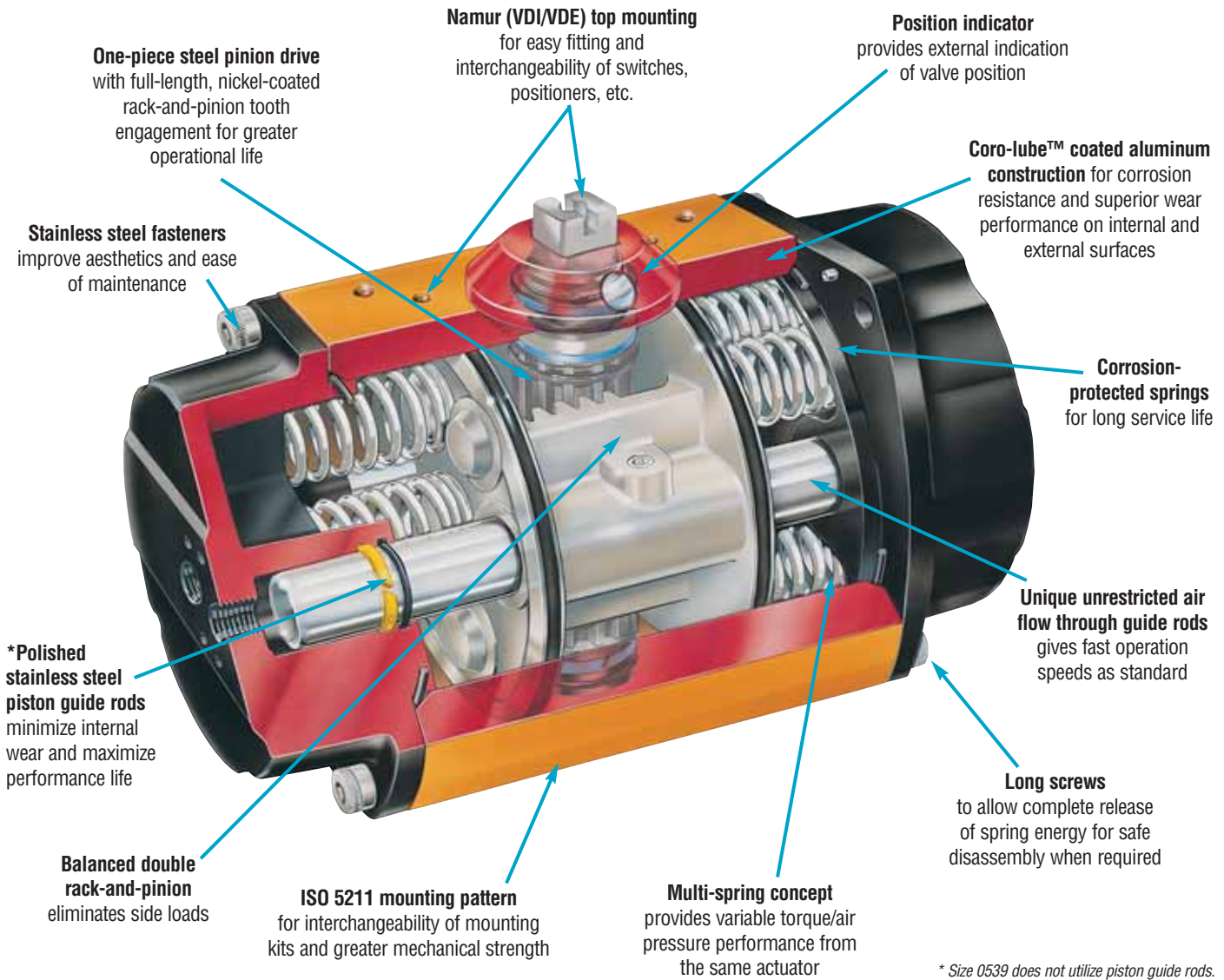


McCanna Actuation Systems Series 39 Pneumatic Actuator

*Twin-piston, double rack-and-pinion pneumatic actuator
offers long cycle life for rotary applications*

Series 39 Pneumatic Actuators

High cycle pneumatic power for on/off or throttling control of rotary valves and dampers



** Size 0539 does not utilize piston guide rods.*

Features and Benefits

- Available as spring-return or double-acting
- Large range of sizes for efficient torque matching
- All parts sealed and greased for life, no maintenance required
- Safe disassembly, no special tools required
- Can be mounted for fail-open or fail-closed operation
- Backed by our exclusive two-year warranty

Accessories and Options

End-Mounted Limit Switches

(CSA and FM Approved)



Where compact installation is required, an end-mounted limit switch module is available. This module comes as a combined Watertight TYPE 4 and Hazardous Location (Class I, Division 1, 2, Group C, D; and Class II, Division 1, 2, Group E, F, G) and comes with two SPDT or two DPDT mechanical switches. It is also available with SPST AC or DC proximity switches.

Top-Mounted Limit Switches



One or two switches can be furnished as required. The switch has a cast aluminum housing, SPDT switch, and a one-way roller lever. General Purpose (TYPE 1), Watertight (TYPE 1, 3, 3 R, and 4), and Hazardous Location (TYPE 7, Class I, Groups C and D; and TYPE 9, Class II, Groups E, F and G) housings are available.

Position Indicator



Polyester Coating



Bidirectional Travel Stops



Declutchable Geared Override



Also Available

- Top-Mounted Stainless Steel Rotary Switches
- Stainless Steel Springs
- Rebreather Gasket

ACCESS™ — For Integral Control with Optional Digital Protocol Compatibility

There's never been this much performance in such a small package—until now. ACCESS is an industry innovation which integrates the pneumatic actuator, limit switches, solenoid and diagnostics into a single package!

The ACCESS is available for either conventional wiring applications or for simple communications with the most common digital protocols.

The ACCESS is significantly more compact than conventional actuators with accessories and eliminates unnecessary brackets, couplings and additional enclosures. Advanced digital technology provides instant valve/actuator status. A simple cable connection—for both power supply and communications—reduces engineering time, wiring and installation costs.



Member of ASI Trade Organization and the Open DeviceNet Vendor Association



Pulsair® Zero Air Bleed Positioner; MAStermind® Switches/Dribble Feed



MAStermind®

For pneumatically actuated control valves such as the characterized seat control valve shown here, Flowserve offers the Pulsair loop-powered positioner with auto calibration and zero air bleed. Operated by a 4-20 mA analog signal, Pulsair's microprocessor and three-button keypad provide on-site automatic calibration, split-range, speed adjustment, fault-delay, etc. Available with HART Protocol®, FOUNDATION fieldbus and Profibus.

Also available, is the MAStermind Modular Accessory System. This is a highly versatile actuator accessory package containing any of the following options: limit switches, solenoids, 4-20 mA position feedback—all in an explosion-proof housing. It also includes an optional dribble feed arrangement for filling, batching and blending processes.



Pulsair III

Operating Principle

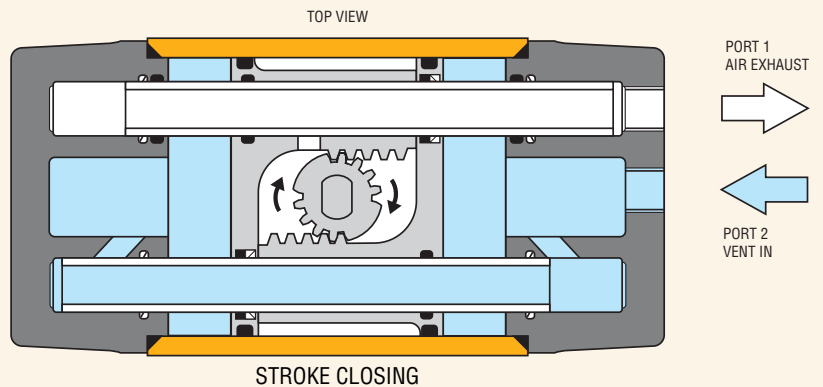
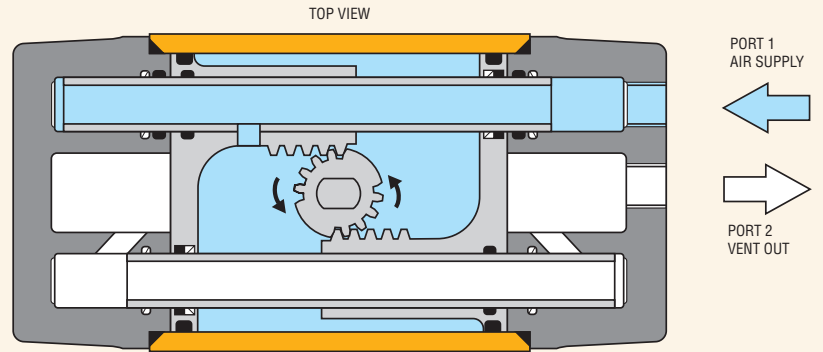


The Series 39 Pneumatic Actuator design is based on the opposed rack-and-pinion principle utilizing piston guide rods to guarantee part alignment. The fully supported guide rods minimize friction and wear between the pistons and the body bore.

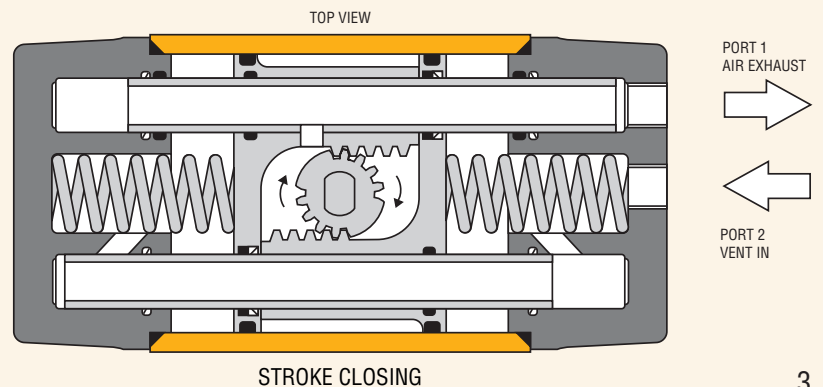
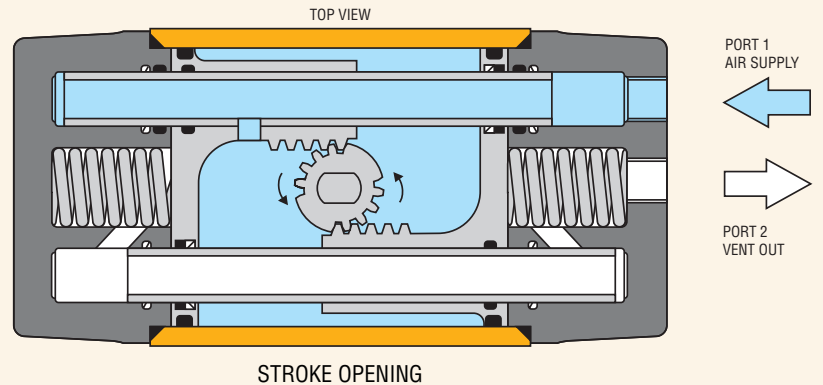
In the double-acting actuator, compressed air is applied to Port 1. The air flows through the rear guide rod and enters the center chamber to push the pistons apart, turning the shaft counterclockwise (as seen from above) to open the valve. During this action, air in the end caps is vented through Port 2 via the front guide rod. Action is reversed, i.e., the valve is closed by applying air to Port 2 and venting air through Port 1.

In a fail-safe spring-return actuator, springs are nested in the end caps. The number of springs in each cap depends on the available supply air pressure and required torque output. Air is supplied through Port 1 to the center chamber to push the pistons apart, which compresses the springs. During this action, air in the end caps is vented through Port 2 via the front guide rod. When air is vented out through Port 1 (via a three-way solenoid valve) the springs push the pistons back together thus closing the valve. Port 2 is continuously vented. The springs provide a dependable, safe closure in the event of electrical or air supply failure.

DOUBLE-ACTING ACTUATOR 39



SPRING-RETURN ACTUATOR 39S

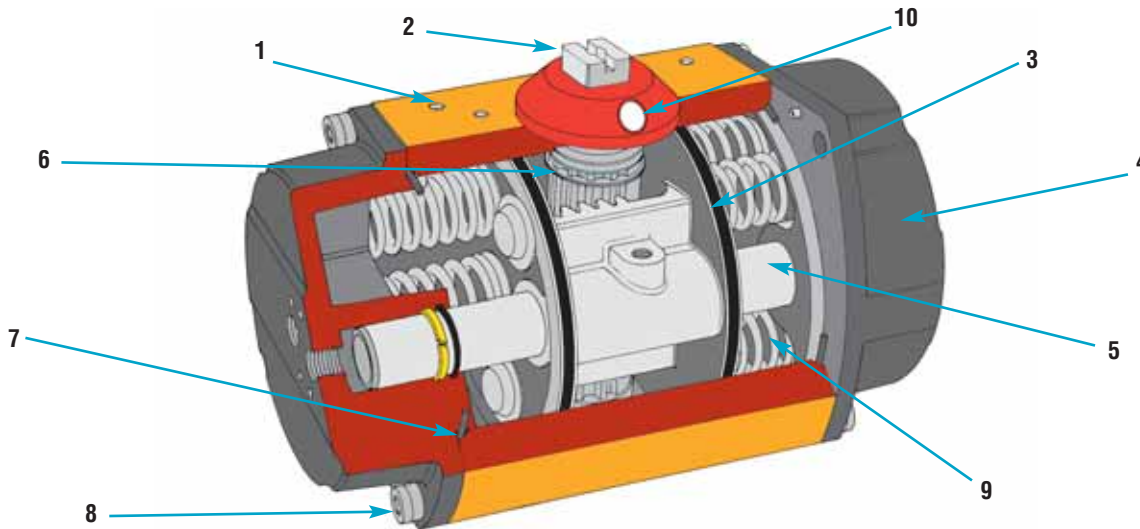


Product Specifications

- Pneumatic Actuators shall be of a dual-piston design for compactness, highest torque output, minimal air consumption and even weight distribution (balanced) on the valve stem.
- Actuators shall be equipped with two piston guide rods to bear the lateral rack-and-pinion thrust forces, increasing piston seal life and eliminating the possibility of cylinder scratching by the pistons. Elastomeric seals shall not be loaded as bearings.
- The torque shall be generated through a double rack-and-pinion gearing mechanism with full-length, uninterrupted engagement of the rack-and-pinion teeth.
- The rack shall be machined as part of the piston in order to extend the actuator life and eliminate hysteresis.
- Actuator housings shall be protected both internally and externally with a nickel acetate-filled coating for corrosion resistance.
- Single-acting actuators shall use multi-springs at each end to eliminate uneven forces on the pistons and shall be field adaptable to reduced pressure air supplies.
- Actuators shall have external extended shafts for position indication and manual override capability.
- Actuators shall have optional integral end-mounted limit switches, reducing overall height and allowing the use of extended actuator shafts as manual override.
- Actuators shall have optional integral solenoid valving without the use of transfer tubes. Valving shall incorporate fail-safe action upon interruption of electrical signal.
- Actuator manufacturer shall offer the minimum of a two-year warranty.

As manufactured and offered by Flowserve.

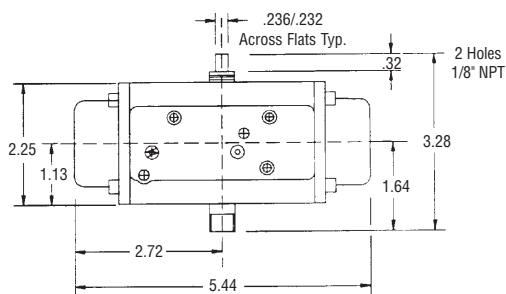
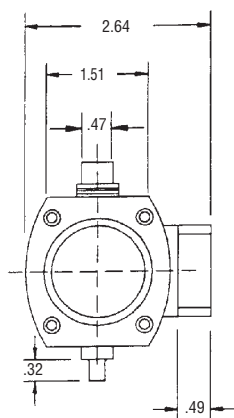
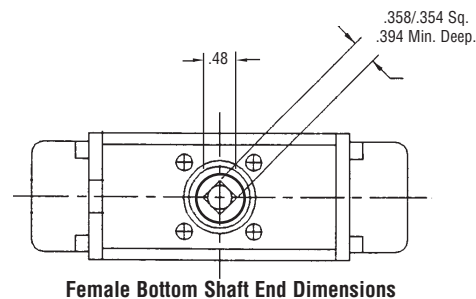
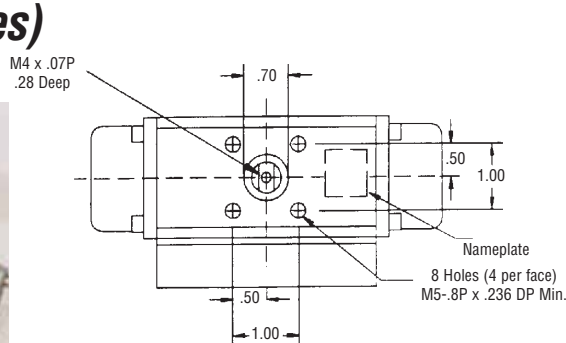
Parts List/Material Specifications



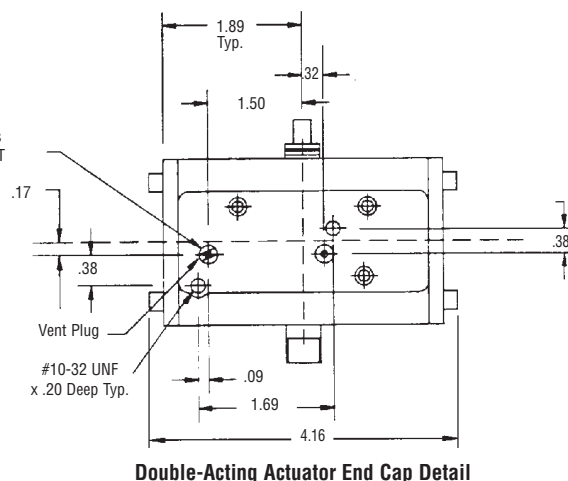
| ITEM NO. | DESCRIPTION | MATERIAL/FINISH |
|----------|--------------------|---|
| 1 | Body | Aluminum (Extrusion) Anodized |
| 2 | Pinion | Carbon Steel (Corrosion-Resistant Coated) |
| 3 | Pistons | Aluminum |
| 4 | End Caps | Aluminum Anodized |
| 5 | Guide Rods | Stainless Steel |
| 6 | Bearings | Acetal |
| 7 | "O" Rings | Nitrile Rubber |
| 8 | End Cap Screws | Stainless Steel |
| 9 | Springs | Chrome Silicon (Corrosion-Resistant Coated) |
| 10 | Position Indicator | Polyethylene |

The Series 0539 Pneumatic Actuator

Dimensions (inches)



NOTE: Mounting pattern identical top and bottom.



Mounting Configurations

Namur – inches (mm)

| Actuator Size | Mounting Pattern | Shaft Height |
|---------------|------------------------------------|----------------|
| 0539 | WCC | WCC |
| 1039 | 3.15 x 1.18 x M5 (80.0 x 30.0) | .79 (20.0) |
| 1539 | 3.15 x 1.18 x M5 (80.0 x 30.0) | .79 (20.0) |
| 2039 | 3.15 x 1.18 x M5 (80.0 x 30.0) | .79 (20.0) |
| 2539 | 3.15 x 1.18 x M5 (80.0 x 30.0) | 1.18 (30.0) |
| 3039 | 3.15 x 1.18 x M5 (80.0 x 30.0) | 1.18 (30.0) |
| 3339 | 3.15 x 1.18 x M5 (80.0 x 30.0) | 1.18 (30.0) |
| 3539 | 3.15 x 1.18 x M5 (80.0 x 30.0) | 1.18 (30.0) |
| 4039 | 5.12 x 1.18 x M5 (130.0 x 30.0) | 1.97 (50.0) |
| 4239 | 5.12 x 1.18 x M5 (130.0 x 30.0) | 1.97 (50.0) |
| 4539 | — | — |
| 5039 | — | — |

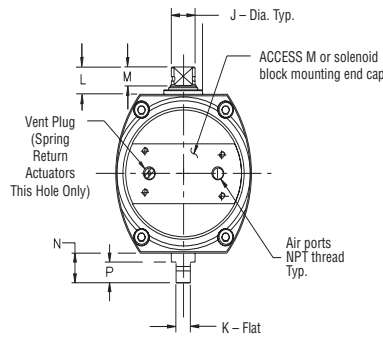
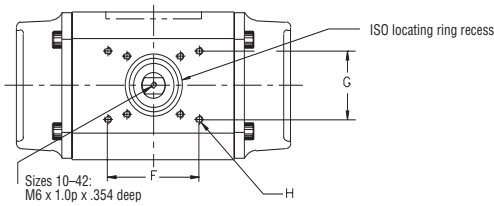
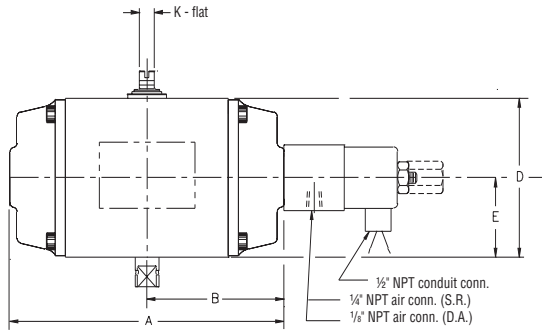
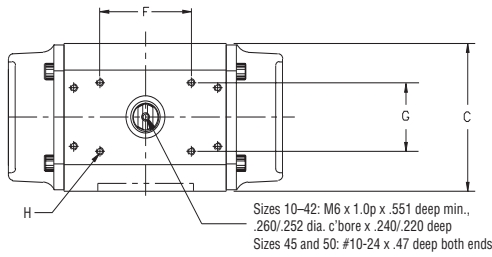


*See boxed note on opposite page (8).

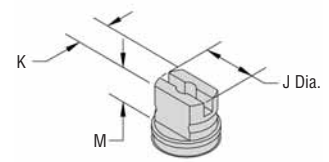
ISO – inches (mm)

| Actuator Size | ISO 5211 | Mounting Pattern |
|---------------|----------|--------------------|
| 0539 | F03 | 1.00 sq. (25.4) |
| 1039 | F04 | 1.17 sq. (29.7) |
| 1539 | F05 | 1.39 sq. (35.3) |
| 2039 | F07 | 1.95 sq. (49.5) |
| 2539 | F07 | 1.95 sq. (49.5) |
| 3039 | F10 | 2.84 (72.1) |
| 3339 | F12 | 3.48 (88.4) |
| 3539 | F12 | 3.48 (88.4) |
| 4039 | F14 | 3.90 (99.1) |
| 4239 | F16 | 4.59 (117) |
| 4539 | — | — |
| 5039 | — | — |

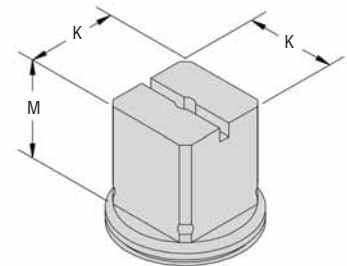
Dimensions Inches (mm)



Shaft Dimensions (Top shaft shown)



Sizes 10-20



Sizes 25-50

* Tapped mounting hole dimensions are those of Flowserve design and are designed for McCanna Actuation Systems' valve mounting kits and accessories. Series 39 actuators are also tapped for ISO and Namur mounting. See opposite page.

Series 39 Actuator Dimensions* - Inches (mm)

| ACTUATOR | A | B | C | D | E | F | G | H | AIR PORTS |
|----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------|-----------|
| 1039 | 6.10 (155) | 3.05 (77.5) | 3.02 (76.7) | 3.37 (85.6) | 1.69 (42.9) | 2.00 (50.8) | 1.38 (35.1) | 10-32 UNF-2B .30 DP | 1/8" NPT |
| 1539 | 7.66 (195) | 3.83 (97.3) | 3.70 (94.0) | 4.09 (104) | 2.05 (52.1) | 2.00 (50.8) | 1.38 (35.1) | 10-32 UNF-2B .31 DP | 1/8" NPT |
| 2039 | 9.24 (235) | 4.62 (117) | 4.57 (116) | 4.92 (125) | 2.46 (62.5) | 2.00 (50.8) | 1.38 (35.1) | 10-32 UNF-2B .32 DP | 1/8" NPT |
| 2539 | 10.62 (270) | 5.31 (135) | 5.34 (136) | 5.78 (147) | 2.89 (73.4) | 4.22 (107) | 1.94 (49.3) | 1/4-28 UNF-2B .42 DP | 1/4" NPT |
| 3039 | 12.77 (324) | 6.39 (162) | 6.10 (155) | 6.60 (168) | 3.30 (83.8) | 6.34 (161) | 2.87 (72.9) | 1/4-28 UNF-2B .64 DP | 1/4" NPT |
| 3339 | 15.64 (397) | 7.82 (199) | 8.11 (206) | 8.44 (214) | 4.22 (107) | 6.34 (161) | 3.39 (86.1) | 1/4-28 UNF-2B .72 DP | 1/4" NPT |
| 3539 | 16.62 (422) | 8.31 (211) | 8.34 (212) | 8.54 (217) | 4.27 (109) | 8.38 (213) | 4.00 (102) | 1/4-28 UNF-2B .77 DP | 1/4" NPT |
| 4039 | 20.02 (509) | 10.01 (254) | 9.64 (245) | 10.87 (276) | 5.87 (149) | 9.59 (244) | 4.63 (118) | 7/16-20 UNF-2B .91 DP | 1/4" NPT |
| 4239 | 24.24 (616) | 12.12 (308) | 11.14 (283) | 12.44 (170) | 6.69 (149) | 9.59 (244) | 4.63 (118) | 7/16-20 UNF-2B .81 DP | 1/4" NPT |
| 4539 | 22.87 (581) | 11.43 (290) | 13.19 (335) | 13.49 (343) | 6.74 (171) | 13.00 (330) | 6.25 (159) | 5/8-18 UNF .98 DP | 1/4" NPT |
| 5039 | 24.94 (633) | 12.47 (317) | 15.39 (391) | 15.52 (394) | 7.76 (197) | 15.50 (394) | 7.50 (191) | 5/8-18 UNF .98 DP | 1/4" NPT |

Shaft Dimensions

| J | K | L | M | N | P |
|----------------|-----------------|----------------|----------------|----------------|----------------|
| .59 (15.0) | .358 (9.1) | .79 (20.1) | .63 (16.0) | .72 (18.3) | .59 (15.0) |
| .63 (16.0) | .498 (12.7) | .79 (20.1) | .53 (13.5) | .87 (22.1) | .65 (16.5) |
| .80 (20.3) | .498 (12.7) | .79 (20.1) | .53 (13.5) | .85 (21.6) | .65 (16.5) |
| .99 (25.2) | .748 (19.0) | 1.18 (30.0) | .88 (22.4) | 1.14 (29.0) | .85 (21.6) |
| 1.13 (28.7) | .875 (22.2) | 1.18 (30.0) | .87 (22.1) | 1.19 (30.2) | .92 (23.4) |
| 1.44 (36.6) | 1.125 (28.6) | 1.18 (30.0) | .84 (21.3) | 1.60 (40.6) | 1.25 (31.8) |
| 1.44 (36.6) | 1.125 (28.6) | 1.18 (30.0) | .83 (21.1) | 1.52 (38.6) | 1.21 (30.7) |
| 1.80 (45.7) | 1.375 (34.9) | 1.97 (50.0) | 1.46 (37.1) | 1.96 (49.8) | 1.93 (49.0) |
| 2.63 (66.8) | 2.000 (50.8) | 1.97 (50.0) | 1.54 (39.1) | 1.96 (49.8) | 1.93 (49.0) |
| — | 2.000 (50.8) | 2.30 (58.4) | 1.50 (38.1) | 2.30 (58.4) | 1.50 (38.1) |
| — | 2.250 (57.2) | 2.71 (68.8) | 1.75 (44.5) | 2.71 (68.8) | 1.75 (44.5) |

Solenoid Mounting

SOLENOID BLOCK – DIRECT-MOUNTED

The solenoid end cap of each actuator is pre-drilled to allow rapid attachment of either a double-acting or spring-return solenoid control block.

The double-acting solenoid control block provides extremely fine and independent adjustments for speed control on the opening and closing strokes of a double-acting actuator (20:1 ratio). The double-acting solenoid control block can be overridden by manual operation of the control block spool.

The spring-return solenoid control block provides an optional adjustment for speed control on the spring stroke of a spring-return actuator.

Both double-acting and spring-return styles will return to the actuator “closed” position (pistons together) upon electrical failure.

General Purpose TYPE 1 Solenoid Coil Data

(Class A Coil)

| VOLTAGE | INRUSH AMPS | HOLDING AMPS |
|------------------|-------------|--------------|
| 24 VAC 50/60 Hz | 1.20 | .80 |
| 120 VAC 50/60 Hz | .30 | .15 |
| 240 VAC 50/60 Hz | .12 | .08 |
| 12 VDC | — | .70 |
| 24 VDC | — | .35 |

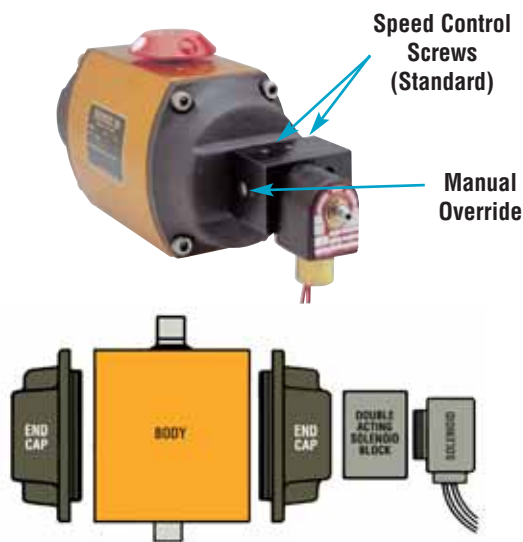
Watertight/Hazardous Locations TYPE 4, 4x, 7 & 9 Solenoid Coil Data

(Class F Coil)

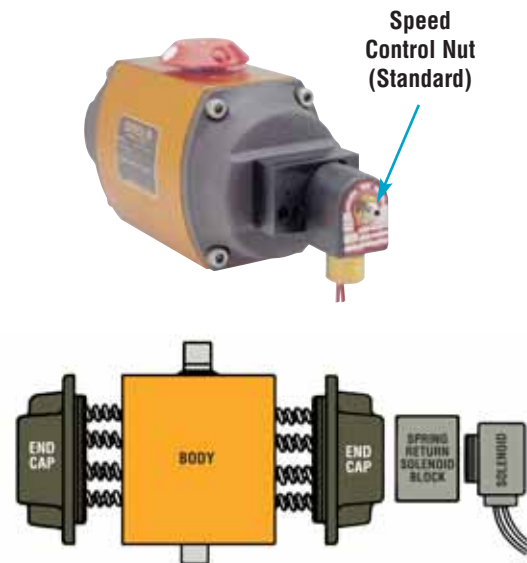
| VOLTAGE | INRUSH AMPS | HOLDING AMPS |
|------------------|-------------|--------------|
| 24 VAC 50/60 Hz | 1.13 | .71 |
| 120 VAC 50/60 Hz | .23 | .14 |
| 240 VAC 50/60 Hz | .11 | .07 |
| 12 VDC | — | .81 |
| 24 VDC | — | .41 |

Solenoids are available in the following types: General Purpose TYPE 1; Watertight TYPE 4, 4x; Hazardous Locations TYPE 7 (UL & CSA listed for Class I, Division I, Groups A, B, C & D) and TYPE 9 (UL & CSA listed for Class II, Groups E, F & G). The Type 7 solenoid is also rated Type 4, 4x.

Four-Way Double-Acting Solenoid



Three-Way Spring-Return Solenoid



Namur Solenoid Interface

Optional Namur VDI/VDE 3845 interface end caps and direct-mount Namur solenoids are available, making the Series 39 a truly international actuator. All ports are G 1/4 except sizes 05 and 10, which are G 1/2. Consult table on back cover for ordering details.

Three-way Namur solenoids include a standard rebreather feature.



Namur End Cap (designated V64)



Namur Mounted Solenoid

Torque Output

Sizing

Determine appropriate valve torque requirements from valve literature. For double-acting actuators, select the actuator whose torque output at available air supply exceeds breakaway torque requirements of the valve. For detailed instructions, consult McCanna Actuation Systems Ball Valve Actuator Selection Manual.

For fail-closed, spring-return actuators, select the appropriate size actuator whose torque output at the end of the spring stroke (at available air supply) is sufficient to close the valve.

For fail-open spring-return actuators, select appropriate actuator whose torque output at the end of the air stroke is sufficient to close the valve. For fail-open actuators, it is also necessary to determine that the torque output at the start of the spring stroke exceeds breakaway requirements of the valve.

Spring-Return Actuator Torque Output (in-lb/N m)

| No. of springs | | Operating Pressure psi (Bar) | | | | | | | | | | | | | |
|----------------|--------|------------------------------|-------|----------|------|----------|------|----------|------|----------|-------|----------|-------|----|--|
| | | 30 (2.0) | | 40 (2.7) | | 50 (3.4) | | 60 (4.1) | | 70 (4.8) | | 80 (5.4) | | | |
| Model No. | Stroke | Start | End | Start | End | Start | End | Start | End | Start | End | Start | End | | |
| 1039 | Air | 70 | 40 | 85 | 60 | 105 | 60 | 125 | 70 | 170 | 120 | 175 | 95 | | |
| | Spring | 58 | 35 | 60 | 35 | 95 | 55 | 125 | 75 | 125 | 75 | 160 | 95 | | |
| 1539 | Air | 140 | 60 | 130 | 85 | 200 | 125 | 240 | 150 | 260 | 155 | 325 | 190 | | |
| | Spring | 100 | 60 | 105 | 74 | 165 | 105 | 220 | 145 | 220 | 145 | 280 | 185 | | |
| 2039 | Air | 220 | 150 | 300 | 240 | 340 | 235 | 415 | 280 | 575 | 440 | 600 | 360 | | |
| | Spring | 140 | 95 | 190 | 125 | 300 | 195 | 400 | 265 | 400 | 265 | 505 | 335 | | |
| 2539 | Air | 220 | 110 | 560 | 400 | 600 | 350 | 730 | 420 | 925 | 655 | 980 | 550 | | |
| | Spring | 240 | 170 | 345 | 210 | 540 | 330 | 720 | 450 | 720 | 450 | 915 | 575 | | |
| 3039 | Air | 324 | 180 | 840 | 610 | 965 | 600 | 1130 | 690 | 1575 | 1145 | 1650 | 920 | | |
| | Spring | 36.6 | 20.3 | 94.9 | 68.9 | 108 | 67.8 | 128 | 78.0 | 178 | 129 | 186 | 104 | | |
| 3339 | Air | | | 1550 | 1160 | 1810 | 1200 | 2060 | 1220 | 2700 | 1860 | 2950 | 1900 | | |
| | Spring | | | 175 | 131 | 205 | 136 | 233 | 138 | 305 | 210 | 333 | 215 | | |
| 3539 | Air | 1560 | 1260 | 2100 | 1470 | 2360 | 1450 | 2850 | 1730 | 3570 | 2615 | 3850 | 2210 | | |
| | Spring | 176.3 | 142.4 | 237 | 166 | 267 | 164 | 322 | 195 | 428 | 295 | 435 | 250 | | |
| 4039 | Air | 900 | 720 | 1330 | 850 | 2070 | 1330 | 2770 | 1815 | 2770 | 1815 | 3500 | 2300 | | |
| | Spring | 101.7 | 81.4 | 150 | 96.0 | 234 | 150 | 313 | 205 | 313 | 205 | 395 | 260 | | |
| 4239 | Air | | | 3410 | 2300 | 3980 | 2350 | 4470 | 2390 | 5620 | 3450 | 6150 | 3500 | | |
| | Spring | | | 435 | 170 | 422 | 253 | 562 | 337 | 562 | 337 | 702 | 423 | | |
| 4539 | Air | | | 6550 | 4520 | 7280 | 4140 | 7960 | 3390 | 10510 | 6190 | 10920 | 5590 | | |
| | Spring | | | 740 | 511 | 822 | 468 | 899 | 383 | 1187 | 699 | 1233 | 632 | | |
| 5039 | Air | | | 4560 | 2390 | 6900 | 3800 | 9290 | 4890 | 9290 | 4890 | 11720 | 6370 | | |
| | Spring | | | 515 | 270 | 780 | 430 | 1049 | 550 | 1049 | 550 | 1324 | 720 | | |
| No. of springs | | 12 | | | 16 | | | 18 | | | 22 | | | 24 | |
| 4539 | Air | | | 8700 | 4000 | 10600 | 4300 | 13200 | 5900 | 14900 | 6100 | 17600 | 8000 | | |
| | Spring | | | 983 | 452 | 1200 | 485 | 1490 | 667 | 1680 | 689 | 1990 | 904 | | |
| 5039 | Air | | | 8300 | 4000 | 11800 | 5500 | 15600 | 6300 | 16600 | 7800 | 18000 | 8400 | | |
| | Spring | | | 938 | 452 | 1330 | 622 | 1760 | 712 | 1880 | 881 | 2030 | 949 | | |
| 5039 | Air | | | 12500 | 6000 | 15500 | 6000 | 19500 | 8500 | 21800 | 8000 | 26500 | 11500 | | |
| | Spring | | | 1410 | 678 | 1750 | 678 | 3250 | 960 | 2460 | 904 | 2990 | 1330 | | |
| 5039 | Air | | | 13000 | 6500 | 18000 | 8500 | 20500 | 9500 | 26000 | 12200 | 28500 | 13500 | | |
| | Spring | | | 1470 | 7340 | 2030 | 960 | 2320 | 1070 | 2940 | 1380 | 3220 | 1520 | | |

N m = Newton meter, the standard metric measure of torque

Double-Acting Actuator Torque Output (in-lb/N m)

| Model No. | Operating Pressure psi (Bar) | | | | | | | | | |
|-----------|------------------------------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|
| | 30 (2.0) | 40 (2.7) | 50 (3.4) | 60 (4.1) | 70 (4.8) | 80 (5.4) | 90 (6.1) | 100 (6.8) | 110 (7.5) | 120 (8.2) |
| 05 | 33.6 | 48.6 | 59.7 | 73.5 | 86.3 | 97.4 | 106 | 126 | 137 | 148 |
| 1039 | 80 | 125 | 160 | 200 | 245 | 270 | 310 | 350 | 385 | 425 |
| 1539 | 9.3 | 14.1 | 18.1 | 22.5 | 27.7 | 30.5 | 35.0 | 39.6 | 43.5 | 48.0 |
| | 155 | 240 | 300 | 370 | 460 | 510 | 580 | 650 | 725 | 790 |
| 2039 | 17.6 | 27.1 | 33.9 | 41.8 | 52.0 | 57.6 | 65.5 | 73.4 | 81.9 | 89.3 |
| | 285 | 435 | 545 | 680 | 840 | 935 | 1070 | 1200 | 1330 | 1460 |
| 2539 | 32 | 49.1 | 61.6 | 76.8 | 94.9 | 106 | 121 | 136 | 150 | 165 |
| | 590 | 785 | 980 | 1180 | 1375 | 1570 | 1770 | 1965 | 2160 | 2355 |
| 3039 | 66.6 | 88.4 | 111 | 133 | 155 | 177 | 200 | 222 | 244 | 266 |
| | 790 | 1200 | 1500 | 1860 | 2305 | 2580 | 2935 | 3290 | 3645 | 4000 |
| 3339 | 89 | 136 | 169 | 210 | 260 | 292 | 332 | 372 | 412 | 452 |
| | 1600 | 2230 | 2280 | 3520 | 4160 | 4800 | 5430 | 6070 | 6720 | 7330 |
| 3539 | 181 | 252 | 325 | 398 | 470 | 542 | 614 | 686 | 760 | 828 |
| | 2220 | 2975 | 3900 | 4800 | 5600 | 6400 | 7200 | 8000 | 8800 | 9600 |
| 4039 | 250 | 336 | 441 | 542 | 633 | 723 | 814 | 904 | 994 | 1080 |
| | 3510 | 4710 | 6170 | 7390 | 8710 | 10040 | 11400 | 12700 | 13970 | 15270 |
| 4239 | 397 | 532 | 697 | 835 | 984 | 1135 | 1288 | 1435 | 1579 | 1726 |
| | 6500 | 8700 | 10900 | 13090 | 15330 | 17530 | 19720 | 21920 | 24120 | 26310 |
| 4539 | 734 | 983 | 1232 | 1479 | 1732 | 1981 | 2228 | 2477 | 2725 | 2973 |
| | 9000 | 12700 | 16100 | 19500 | 22700 | 26000 | 29400 | 32600 | 36000 | 39500 |
| 5039 | 1016 | 1430 | 1820 | 2200 | 2560 | 2940 | 3320 | 3680 | 4070 | 4460 |
| | 13145 | 19000 | 24000 | 29000 | 34000 | 40000 | 45000 | 50000 | 55000 | 60000 |
| 5039 | 1485 | 2150 | 2710 | 3280 | 3840 | 4520 | 5080 | 5650 | 6210 | 6780 |

Torque Output Series 0539 (in-lb/N m)
Two-Spring-Return Actuator

| | Operating Pressure psi (Bar) | | | | | |
|--------|------------------------------|-------------|-------------|-------------|-------------|-------------|
| | 50 (3.4) | | 60 (4.1) | | 70 (4.8) | |
| | Start | End | Start | End | Start | End |
| Air | 28 (3.2) | 16 (1.9) | 35 (4.3) | 30 (3.4) | 50 (5.7) | 41 (4.5) |
| Spring | 42 (4.7) | 32 (3.6) | 42 (4.7) | 32 (3.8) | 42 (4.7) | 32 (3.6) |

Torque Output Series 0539 (in-lb/N m)
Four-Spring-Return Actuator

| | Operating Pressure psi (Bar) | |
|--------|------------------------------|-------------|
| | 80 (5.4) | |
| | Start | End |
| Air | 45 (5.1) | 30 (3.4) |
| Spring | 53 (6.0) | 41 (4.6) |

Torque Output Series 0539 (in-lb/N m)
Double-Acting Actuator

| | Operating Pressure psi (Bar) | | | | | | | | |
|-----|------------------------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|
| | 30 (2.0) | 40 (2.7) | 50 (3.4) | 60 (4.1) | 70 (4.8) | 80 (5.4) | 90 (6.1) | 100 (6.8) | 120 (8.2) |
| Air | 33.6 (3.8) | 48.6 (5.5) | 59.7 (6.8) | 73.5 (8.3) | 86.3 (9.8) | 97.4 (11.0) | 106 (12.0) | 126 (14.2) | 148 (16.7) |

Engineering Data

Air Flow Requirements

| Actuator Size | Under 4 ft. Run | Over 4 ft. Run |
|--|-----------------|----------------|
| 0539, 1039, 1539, 2039, 2539 | ¼" Tubing | ½" Tubing |
| 3039, 3339, 3539, 4039, 4239, 4539, 5039 | ¼" Tubing | ½" Tubing |

Actuator Weights*

| Actuator Model | Double-Acting lb. (kg) | Spring-Return lb. (kg) |
|----------------|---------------------------|---------------------------|
| 0539 | 1.7 (.77) | 2.0 (.90) |
| 1039 | 3 (1.3) | 3.5 (1.6) |
| 1539 | 6 (2.7) | 7 (3.1) |
| 2039 | 10 (4.5) | 12 (5.5) |
| 2539 | 16.25 (4.5) | 18.5 (8.4) |
| 3039 | 24.6 (11) | 27 (12) |
| 3339 | 50.6 (23) | 54.5 (24.7) |
| 3539 | 58 (26) | 65 (30) |
| 4039 | 70 (32) | 107 (48.6) |
| 4239 | 158 (68) | 192 (83) |
| 4539 | 213 (97) | 253 (115) |
| 5039 | 304 (138) | 355 (161) |

*without solenoid

Stroke Time (seconds)

| Model No. | Minimum (Unloaded) | | |
|-----------|--------------------|-------------|--------------------------|
| | D/A Actuator | SR Actuator | With Max.* Speed Control |
| 0539 | Less than 1 | Less than 1 | 10 |
| 1039 | Less than 1 | Less than 1 | 10 |
| 1539 | Less than 1 | 1 | 15 |
| 2039 | 1 | 1-2 | 15 |
| 2539 | 2-3 | 2-3 | 18 |
| 3039 | 3-4 | 3-4 | 20 |
| 3339 | 4-5 | 7-8 | 25 |
| 3539 | 4-5 | 8-9 | 25 |
| 4039 | 5-6 | 9-10 | 30 |
| 4239 | 10-11 | 11-12 | 36 |
| 4539 | 10-12 | 11-13 | 40 |
| 5039 | 12-14 | 13-15 | 60 |

*Average times under 50% load conditions, 80 psi (with standard solenoid).

NOTE: These figures are meant as an indication of obtainable speeds only. For more precise figures for any particular application, contact your Flowserve representative. Faster speeds are obtainable, if required, by using additional control equipment.

Speed control with spring-return actuators only available on exhaust air (spring stroke).

Operating Conditions

| | |
|--|--|
| Pressure Range: | 30–120 psi Double-Acting 40–120 psi All Spring-Return Versions* *Standard spring-return units require 80 psi minimum. Reduced-pressure versions are available. |
| Media: | Air or non-corrosive gas. |
| Temperature Range: | 0° to 212°F (-18° to 100°C) actuator only To 100°F (38°C) continuous; actuator with G.P. solenoid To 175°F (79°C) continuous; actuator with Watertight Type 4, 4x or Hazardous Locations Type 4, 4x, 7 & 9 solenoid High-temperature option to 250°F continuous, to 300°F intermittent (without solenoid) Low temperature option to -40°F (without solenoid) |
| Rotation: | Actuators rotate in counterclockwise direction when the outer air connection is pressurized. |
| Movement: Sizes 10–35: Sizes 40–50: | 90° with up to 2° each direction 90° with up to 2° overrun each end |
| Supply Air: | The Series 39 Actuator is factory lubricated. For optimum performance, standard filtered and lubricated air is recommended. |

Series 39 Actuator Free Internal Volume

| | Size | 5 | 10 | 15 | 20 | 25 | 30 | 33 | 35 | 40 | 42 | 45 | 50 |
|-----------------|---------------------------------|------|------|------|------|------|-------|-------|-------|-------|-------|--------|--------|
| Open | Cubic Inches (in ³) | 3.0 | 10.4 | 21.4 | 42.1 | 74.4 | 113.5 | 206.9 | 239.8 | 410.7 | 732.3 | 824.4 | 1456.6 |
| | Litres | 0.05 | .017 | .035 | .069 | 1.22 | 1.86 | 3.39 | 3.93 | 6.73 | 12.00 | 13.51 | 23.87 |
| Close (DA only) | Cubic Inches (in ³) | 3.0 | 13.4 | 23.8 | 45.2 | 79.9 | 125.1 | 292.3 | 338.1 | 499.8 | 847.6 | 1220.5 | 1861.2 |
| | Litres | 0.05 | 0.22 | 0.39 | 0.74 | 1.31 | 2.05 | 4.79 | 5.54 | 8.19 | 13.89 | 20.00 | 30.50 |

Actuator air consumption is calculated using the free internal volume and supply pressure in the following equation.

$$\text{Air Consumption per Stroke} = \frac{V}{1728} \left(\frac{\text{Supply Pressure} + 14.7}{14.7} \right)$$