

RHINO VALVES WORLDWIDE



Pneumatic Actuators



LICENSE No. 6D-0321

Robust, reliable, rapids.
Suitable to any 90 degrees rotation valves
In different configurations for any application
and adaptation of other automation devices.





PNEUMATIC ACTUATOR



The double pneumatic actuator “Rack and Pinion” of RHINO is one of the best designs in the market. Available as “Double Action” (Air-air) or “Spring Return” with torque outputs for small to large flanged valves.

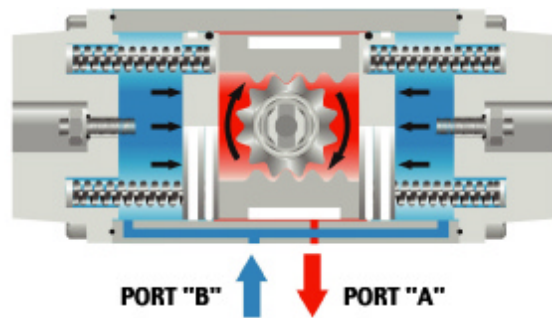
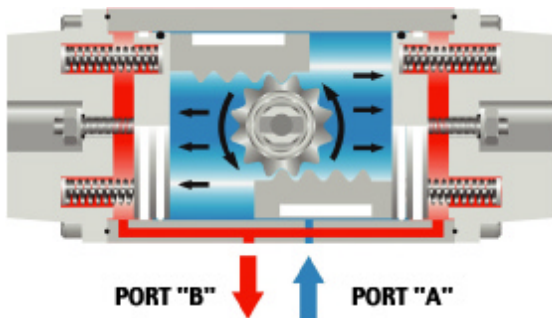
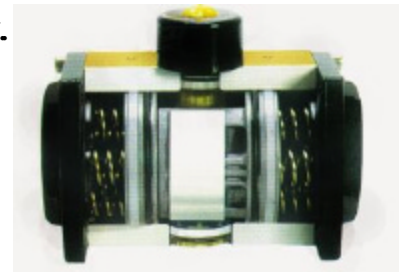
Both actuators have twin cylinders, horizontally opposed incorporated piston guides to assure the correct contact between the “Rack and Pinion” facilitating that the kinetic energy is transformed directly in a “turn room” that will provide a soft and constant torque.

Prepared with bores and threads that meet the international standards NAMUR and ISO. Built in aluminum extrude robust, but light and resistant to the environmental corrosion.

PRINCIPLE OF OPERATION OF THE ACTUATOR ISO5211 WITH SPRING RETURN.

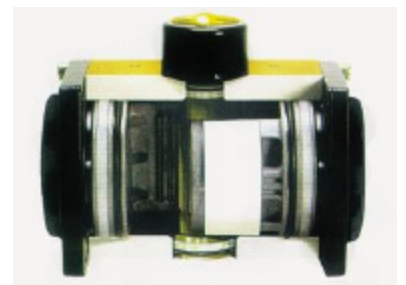
A pressure applied to the Port “A” will cause the internal cavities to pressurize, forcing the pistons to move toward the end, compressing the springs.

The axis rotates in a counter clockwise motion. When stopping the application of pressure in port “A” the springs will exercise pressure to close the pistons and to rotate the axis quickly in a clockwise motion. This action is frequently used to close a valve of a turn room in a way “usually closed.”



The axis will rotate in counter clockwise motion when pressure is applied in Port “A”, it forces the pistons to separate.

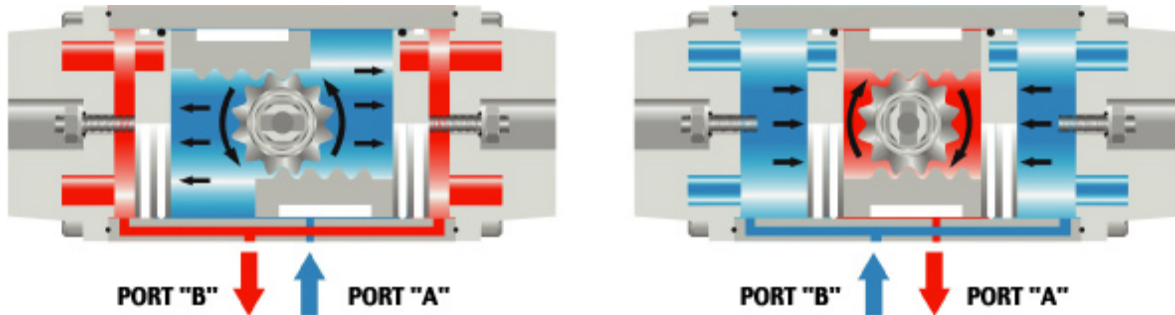
During this operation, the air of the external cavity is expelled through port “B.” The turn of the axis in a clockwise motion is achieved previously with the action contrary to the previously described applying pressure in port “B.”



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PNEUMATIC ACTUATOR



CONSUMPTION OF AIR

| MODEL | | AP1 DA/SR | AP2 DA/SR | AP3 DA/SR | AP3.5 DA/SR | AP4 DA/SR | AP5 DA/SR | AP6 DA/SR | AP8 DA/SR |
|---|-------------------|-----------|-----------|-----------|-------------|-----------|-----------|-----------|-----------|
| SENSE CONTRARY TO THE POINTERS OF THE CLOCK | LITERS | 0.08 | 0.12 | 0.24 | 0.48 | 0.68 | 1.4 | 3.2 | 5.3 |
| | FEET ³ | 0.003 | 0.004 | 0.008 | 0.017 | 0.049 | 0.049 | 0.11 | 0.18 |
| SENSE CONTRARY TO THE POINTERS OF THE CLOCK (ONLY DA) | LITERS | 0.1 | 0.16 | 0.44 | 0.56 | 0.96 | 2.16 | 4 | 8.6 |
| | FEET ³ | 0.0035 | 0.005 | 0.015 | 0.02 | 0.034 | 0.076 | 0.014 | 0.3 |

| MODEL | AP1 | AP2 | AP3 | AP3.5 | AP4 | AP5 | AP6 | AP8 |
|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|------------------------|-----------------|---------------|
| DOUBLE EFFECT | SMALLER THAN 1 SEG. | SMALLER THAN 1 SEG. | SMALLER THAN 1 SEG. | SMALLER THAN 1 SEG. | SMALLER THAN 1 SEG. | SMALLER THAN 1.25 SEG. | 1.5 ~ 2 SECONDS | 3 ~ 4 SECONDS |
| RETURN FOR SPRING | SMALLER THAN 1 SEG. | SMALLER THAN 1 SEG. | SMALLER THAN 1 SEG. | SMALLER THAN 1 SEG. | SMALLER THAN 1 SEG. | 1.5 ~ 2 SECONDS | 2 ~ 3 SECONDS | 4 ~ 6 SECONDS |

WEIGHT

| MODEL | AP1 DA | AP2 DA | AP3 DA | AP3.5 DA | AP4 DA | AP5 DA | AP6 DA | AP8 DA |
|-----------|--------|--------|--------|----------|--------|--------|--------|--------|
| KILOGRAMS | 0.85 | 1.62 | 2.92 | 4.18 | 5.86 | 11.18 | 21.20 | 43.00 |
| LIBRAS | 1.87 | 3.57 | 6.44 | 9.22 | 12.92 | 24.65 | 46.75 | 94.82 |

WEIGHT

| MODEL | AP1 SR | AP2 SR | AP3 SR | AP3.5 SR | AP4 SR | AP5 SR | AP6 SR | AP8 SR |
|-----------|--------|--------|--------|----------|--------|--------|--------|--------|
| KILOGRAMS | 1.08 | 1.74 | 3.16 | 4.66 | 6.34 | 13.1 | 24.60 | 54.50 |
| LIBRAS | 2.38 | 3.84 | 6.97 | 10.28 | 13.98 | 28.89 | 54.20 | 120.20 |



PNEUMATIC ACTUATOR

SPECIFICATIONS

Range of pressure:

Double Acting: 2 bar (29 psi) to 8 bar (116 psi)
Spring return: 3 bar (44 psi) to 8 bar (116 psi)
Maximum pressure of operation 10 bar (145 psi).

Environment: lubricated dry-air, do not use corrosive gas, water or hydraulic oil.

Range of temperature:

Standard : -4°F (-20°C) to + 175°F (80°C)
Optional : -68°F (-120°C) to 302°F (+150°C)
Recommended: -58°F (-50°C) to 175°F (+80°C)

Rotation: counterclockwise when pressure is applied to the Port "A". Clockwise when pressure is applied to the Port B and spring Return operation (see operation principle).

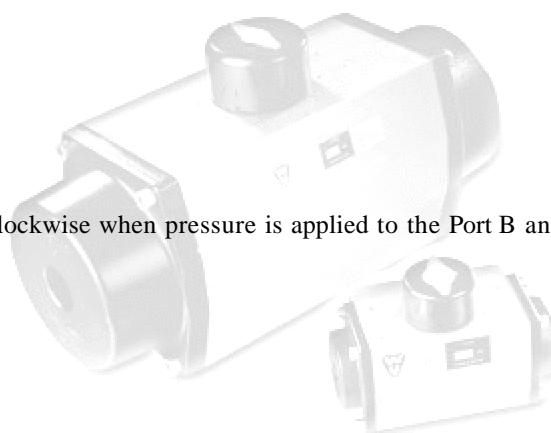
Opening : 90 degrees adjustable of 3 degrees to -3 degrees.

Lubrication: All the parts are lubricated for longer life.

Construction: Appropriate for interior or external facilities.

Connections: Inferior connection according to the standard ISO5211/DIN 3337, interfaces with solenoid valve and superior connection for compatibility of accessories with the international standard VDI/VDE 3845 NAMUR.

Inspection: Each unit is proven hydraulically and certified.

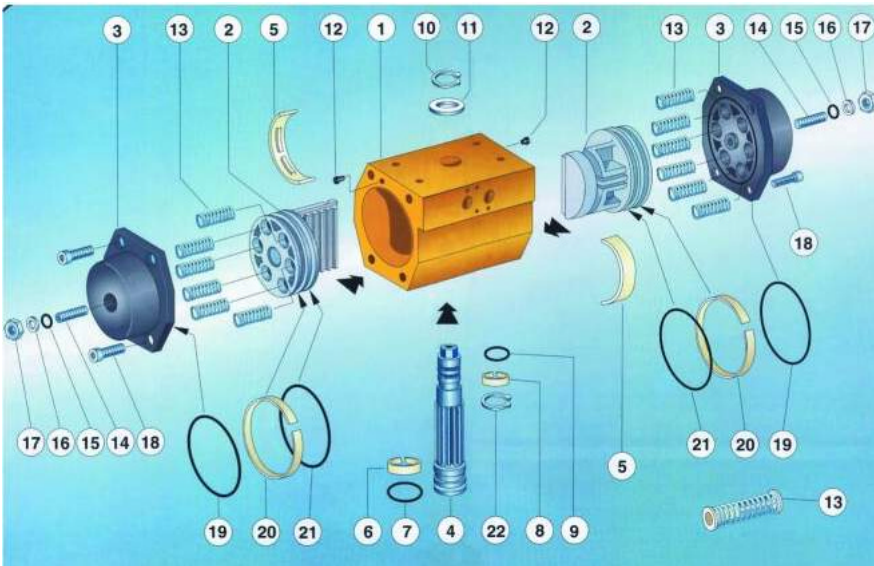


RHINO VALVES WORLDWIDE



PNEUMATIC ACTUATOR

We offer double acting and spring return units with torque outputs from small to larger flanged valves. Mounting pads are drilled and tapped to international NAMUR and ISO standards. Rhino offers a full array of solenoids, limit switches, positioners and other accessories to meet customer needs. Double acting and Spring return actuators are the same size.

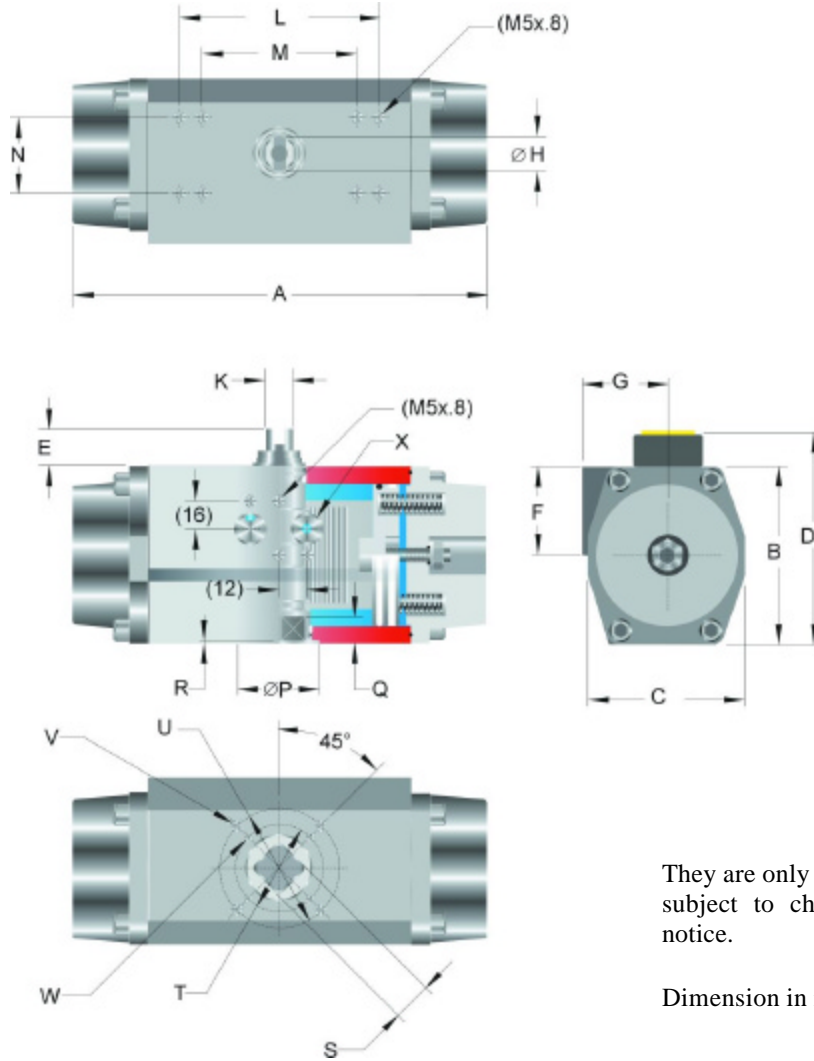


| Item | DESCRIPTION | Q.ty |
|------|-----------------------|------|
| 1 | ACTUATOR BODY | 1 |
| 2 | PISTON | 2 |
| 3 | END CAP | 2 |
| 4 | PINON | 1 |
| 5 | PISTON GUIDE | 2 |
| 6 | PINION GUIDE RING | 1 |
| 7 | O-ring | 1 |
| 8 | PINION GUIDE RING | 1 |
| 9 | O-ring | 1 |
| 10 | CIRCLIP | 1 |
| 11 | THRUST WASHER | 1 |
| 12 | PLUG | 2 |
| 13 | LOADED SPRINGS | 4-12 |
| 14 | SCREW EXTERNAL STROKE | 2 |
| 15 | O-ring | 2 |
| 16 | PLAIN WASHER | 2 |
| 17 | STOP NUT | 2 |
| 18 | END CAP BOLTS | 8 |
| 19 | O-ring | 2 |
| 20 | PISTON GUIDE RING | 2 |
| 21 | O-ring | 2 |
| 22 | CIRCLIP ANTI-BLOW OUT | 1 |

| DESCRIPTION | MATERIAL | FINISH |
|-----------------|--------------------------------------|------------------------------|
| Actuator Body | Extruded Aluminium Alloy | Gold Anodized |
| End Cap | Pressure die casting Aluminium Alloy | Black Epoxic Coated |
| Pinion | Carbon Steel | E.N.P. |
| Piston | Pressure die casting Aluminium Alloy | Natural |
| Guide | Acetal Resin | Natural |
| "O" Rings | Buna N | 60 IRHD |
| Springs | Spring Steel | Epoxic-Coated or Dacromet320 |
| Screws and Nuts | Stanley Steel | Natural |



PNEUMATIC ACTUATOR



They are only as reference and they are subject to changes without previous notice.

Dimension in inches.

| MODEL | A | B | C | D | E | F | G | H | K | L | M | N | P | Q | R | S | T | U | V | W | X | ISO5211 | |
|-------------|-------|------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|------|---------|-----|
| AP1 DA/SR | 5.39 | 2.64 | 2.36 | 3.43 | 0.79 | 1.65 | 1.61 | 0.47 | 0.31 | --- | 3.15 | 1.18 | 0.98 | 0.39 | 0.08 | 0.35 | 1.42 | --- | (M5) | --- | 1/8" | F03 | --- |
| AP2 DA/SR | 5.91 | 3.27 | 2.87 | 4.06 | 0.79 | 1.65 | 1.75 | 0.47 | 0.31 | --- | 3.15 | 1.18 | 1.38 | 0.47 | 0.08 | 0.43 | 1.65 | 1.97 | (M5) | (M6) | 1/4" | F04 | F05 |
| AP3 DA/SR | 8.03 | 3.94 | 3.35 | 4.72 | 0.79 | 1.97 | 1.95 | 0.55 | 0.39 | --- | 3.15 | 1.18 | 1.38 | 0.63 | 0.12 | 0.55 | 1.97 | 2.75 | (M6) | (M8) | 1/4" | F05 | F07 |
| AP3.5 DA/SR | 9.06 | 4.33 | 3.86 | 5.12 | 0.79 | 1.97 | 2.09 | 0.75 | 0.55 | --- | 3.15 | 1.18 | 2.17 | 0.79 | 0.14 | 0.67 | 2.75 | --- | (M8) | --- | 1/4" | F07 | --- |
| AP4 DA/SR | 10.67 | 4.92 | 4.33 | 5.71 | 0.79 | 1.97 | 2.28 | 0.75 | 0.55 | --- | 3.15 | 1.18 | 2.17 | 0.79 | 0.14 | 0.67 | 2.75 | 4.02 | (M8) | (M10) | 1/4" | F07 | F10 |
| AP5 DA/SR | 14.17 | 6.10 | 5.51 | 7.28 | 1.18 | --- | --- | 1.10 | 0.79 | 5.12 | 3.15 | 1.18 | 2.76 | 0.94 | 0.14 | 0.87 | 4.02 | --- | (M10) | --- | 1/4" | F10 | --- |
| AP6 AD/SR | 18.19 | 7.87 | 6.89 | 9.06 | 1.18 | --- | --- | 1.42 | 1.10 | 5.12 | 3.15 | 1.18 | 3.35 | 1.14 | 0.14 | 1.06 | 4.92 | --- | (M12) | --- | 1/4" | F12 | --- |
| AP8 AD/SR | 21.85 | 9.48 | 8.46 | 11.81 | 1.97 | --- | --- | 1.89 | 1.26 | 5.12 | --- | 1.18 | 3.94 | 1.50 | 0.20 | 1.42 | 5.51 | --- | (M16) | --- | --- | F14 | --- |

RHINO VALVES WORLDWIDE



PNEUMATIC ACTUATOR

TORQUES

DOUBLE ACTION. To size a double acting actuator please follow the follow these instructions:

Determine the torque required by the valve, including the recommended security factor of 25% and the minimum pressure of air of available operation. Find it in the following chart and select the column of the minimum pressure of applicable air. find it in the column going down, until finding a torque not smaller than the one required (do not forget the security factor). Next, on that same line, look for the first column on the left and read the number from the pattern to be ordered.

Example, torque of the valve (to the operating pressure and the flow media)

$$80 \text{ Nm} + 25\% = 100 \text{ Nm}$$

Suppose a minimum pressure of air of operation of 5 bar.

Looking for it down in the column of 5 bar a value not smaller than 100 Nm, we find 119 Nm.

Model's number indicated in the first column on the left of that line is AP4 DA.

| WORKING PRESSURE | | BAR/PS1 | | | | | | |
|------------------|--------|---------|--------|--------|--------|---------|---------|---------|
| MODEL | bar | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | psi | 29 | 44 | 58 | 73 | 87 | 102 | 116 |
| AP1 DA | Nm | 5.9 | 8.9 | 11.8 | 14.8 | 17.7 | 21.7 | 24.8 |
| | lbf.in | 52.6 | 79.3 | 105.2 | 132.0 | 157.8 | 193.5 | 221.1 |
| AP2 DA | Nm | 9.4 | 14.1 | 18.8 | 23.5 | 28.2 | 32.9 | 37.6 |
| | lbf.in | 83.8 | 125.7 | 167.7 | 209.6 | 251.5 | 393.5 | 335.4 |
| AP3 DA | Nm | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 | 80.0 |
| | lbf.in | 178.4 | 267.6 | 356.8 | 446.0 | 535.2 | 624.4 | 713.6 |
| AP4 DA | Nm | 34.0 | 51.0 | 68.0 | 85.0 | 102.0 | 119.0 | 136.0 |
| | lbf.in | 303.3 | 454.9 | 606.5 | 758.2 | 909.0 | 1061.5 | 1213.2 |
| AP5 DA | Nm | 48.0 | 71.0 | 95.0 | 119.0 | 142.0 | 168.0 | 192.0 |
| | lbf.in | 428.2 | 633.3 | 847.4 | 1061.0 | 1266.6 | 1498.5 | 1712.6 |
| AP6 DA | Nm | 111.0 | 167.0 | 222.0 | 278.0 | 333.0 | 388.5 | 444.0 |
| | lbf.in | 990.1 | 1489.6 | 1980.2 | 2479.7 | 2970.4 | 3465.4 | 3960.5 |
| AP7 DA | Nm | 227.0 | 340.0 | 454.0 | 567.0 | 680.0 | 794.5 | 908.0 |
| | lbf.in | 2024.8 | 3009.0 | 4049.6 | 5057.6 | 6065.6 | 7087.0 | 8099.4 |
| AP8 DA | Nm | 426.0 | 638.0 | 851.0 | 1064.0 | 1276.0 | 1491.0 | 1704.0 |
| | lbf.in | 3800.0 | 5691.0 | 7591.0 | 9491.0 | 11382.0 | 13299.0 | 15200.0 |

FOR SPRING RETURN . To size a SPRING RETURN actuator follow these instructions:

Determine the torque required by the valve, including the recommended security factor of 25% and the minimum pressure of air of available for operation. Select in the following chart the column of "SPRING TORQUE / 0°" and look for it going down until finding a torque value not smaller than the one required (Please do not forget the security factor).

Next, on that same line, look toward the left column of the minimum applicable air and 0° degrees. The opposing value will also be bigger than the required torque (otherwise look for a bigger actuator). Look for the first column on the left and read the number from the pattern to be ordered. Example:

$$\text{Torque of the valve (to the operation pressure and the driven means)} \\ 60\text{Nm} + 25\% = 75\text{Nm}$$

Suppose a minimum air pressure of operation of 5 bar. Looking down in the column of "breakaway TORQUE / 0°" a value not smaller than 75 Nm, we will find 108 Nm. Looking for it to the left in the column of 5 bar and 0° you will find 108 Nm, as well as it is bigger than the one required, the Model number indicated in the first column on the left of the line is AP5 SR5.

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PNEUMATIC ACTUATOR



Nm
lbf/in

| MODEL | No. OF SPRINGS PER SIDE | WORKING PRESSURE | | | | | | | | | | | | BAR/PSI | | | | | | | | | | | | | | | | | |
|---------|-------------------------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|---------|---------|---------|-------|-------|
| | | 3 | | 44 | | 4 | | 58 | | 5 | | 73 | | 6 | | 87 | | 7 | | 102 | | 6 | | 116 | | SPRING STROKE | | | | | |
| | | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | | | | |
| AP1SR | 2 | 6.50 | 5.40 | 9.40 | 8.30 | 12.40 | 11.30 | 15.30 | 14.20 | 18.30 | 17.20 | 22.40 | 21.30 | 3.90 | 2.40 | 53.00 | 43.20 | 63.80 | 54.00 | 74.60 | 64.80 | 85.40 | 75.60 | 106.20 | 96.40 | 127.00 | 117.20 | 158.00 | 148.20 | 31.20 | 21.40 |
| | 3 | 5.30 | 3.70 | 8.20 | 6.60 | 11.20 | 9.60 | 14.10 | 12.50 | 16.10 | 14.50 | 21.20 | 19.60 | 5.20 | 3.60 | 47.30 | 33.00 | 73.10 | 58.90 | 99.90 | 85.60 | 125.80 | 111.50 | 161.50 | 147.20 | 188.10 | 174.80 | 46.40 | 32.10 | | |
| | 4 | 4.10 | 1.90 | 7.00 | 4.80 | 10.00 | 7.80 | 12.90 | 10.70 | 15.80 | 13.60 | 19.70 | 17.50 | 7.00 | 4.80 | 36.60 | 16.90 | 62.40 | 42.80 | 89.20 | 69.60 | 115.10 | 95.40 | 150.70 | 131.10 | 178.40 | 158.80 | 62.40 | 42.80 | | |
| | 5 | - | - | 3.10 | 2.70 | 8.60 | 6.10 | 11.70 | 9.00 | 15.70 | 13.00 | 19.80 | 16.10 | 8.70 | 6.00 | - | - | 27.70 | 24.10 | 76.60 | 54.40 | 104.40 | 80.30 | 140.00 | 116.00 | 167.70 | 143.60 | 77.60 | 53.50 | | |
| | 6 | - | - | - | - | 7.60 | 4.30 | 10.50 | 7.20 | 14.50 | 11.20 | 17.60 | 14.30 | 10.90 | 7.20 | - | - | - | - | 67.60 | 38.40 | 93.70 | 64.30 | 129.30 | 99.90 | 167.00 | 127.60 | 93.70 | 64.30 | | |
| | 6 | 10.30 | 8.50 | 15.00 | 13.20 | 19.70 | 17.90 | 24.40 | 22.60 | 29.10 | 27.30 | 33.80 | 32.00 | 5.80 | 3.80 | 91.90 | 75.80 | 133.80 | 117.70 | 175.70 | 159.60 | 217.60 | 201.50 | 269.60 | 243.50 | 301.60 | 285.40 | 50.00 | 33.90 | | |
| AP2SR | 2 | 8.40 | 5.70 | 13.10 | 10.40 | 17.80 | 15.10 | 22.50 | 19.80 | 27.20 | 24.50 | 31.90 | 29.20 | 8.40 | 5.70 | 74.90 | 50.90 | 116.90 | 92.80 | 158.80 | 134.70 | 200.70 | 176.60 | 242.60 | 218.50 | 284.50 | 260.40 | 74.90 | 50.80 | | |
| | 3 | - | - | 11.30 | 7.60 | 16.90 | 12.30 | 20.60 | 17.00 | 25.30 | 21.70 | 30.00 | 26.40 | 11.30 | 7.60 | - | - | 99.90 | 67.80 | 141.80 | 109.70 | 183.80 | 151.60 | 225.70 | 193.60 | 267.60 | 235.50 | 99.90 | 67.80 | | |
| | 4 | - | - | - | - | 14.00 | 9.60 | 18.70 | 14.20 | 23.40 | 18.90 | 28.10 | 23.60 | 14.00 | 9.60 | - | - | - | - | 17.40 | 12.00 | 24.90 | 20.50 | 28.00 | 23.60 | 31.10 | 26.70 | 14.00 | 9.60 | | |
| | 5 | - | - | - | - | 12.10 | 6.70 | 16.80 | 11.40 | 21.50 | 16.10 | 25.20 | 20.80 | 16.80 | 11.40 | - | - | - | - | 10.90 | 5.90 | 14.90 | 10.90 | 17.90 | 13.90 | 20.90 | 16.90 | 16.80 | 11.40 | | |
| | 6 | - | - | - | - | 10.90 | 5.90 | 14.90 | 10.10 | 19.80 | 14.30 | 23.70 | 18.50 | 14.90 | 10.10 | - | - | - | - | 8.60 | 4.60 | 12.60 | 8.60 | 15.60 | 11.60 | 18.60 | 14.60 | 10.90 | 10.10 | | |
| | 6 | 22.00 | 18.00 | 32.00 | 28.00 | 42.00 | 38.00 | 52.00 | 48.00 | 62.00 | 58.00 | 72.00 | 68.00 | 12.00 | 8.00 | 196.20 | 160.60 | 295.40 | 249.80 | 374.80 | 329.20 | 453.80 | 408.20 | 533.00 | 487.40 | 612.20 | 566.60 | 107.00 | 71.40 | | |
| AP3SR | 2 | 18.00 | 12.00 | 28.00 | 22.00 | 38.00 | 32.00 | 48.00 | 42.00 | 58.00 | 52.00 | 68.00 | 62.00 | 18.00 | 12.00 | 160.60 | 107.00 | 249.80 | 196.20 | 329.20 | 285.60 | 428.20 | 374.60 | 517.40 | 463.80 | 606.60 | 553.00 | 160.60 | 107.00 | | |
| | 3 | - | - | 24.00 | 16.00 | 34.00 | 26.00 | 44.00 | 36.00 | 54.00 | 46.00 | 64.00 | 56.00 | 24.00 | 16.00 | - | - | 214.10 | 142.70 | 303.30 | 231.90 | 392.50 | 321.10 | 481.70 | 410.30 | 570.90 | 499.50 | 214.10 | 142.70 | | |
| | 4 | - | - | - | - | 30.00 | 20.00 | 40.00 | 30.00 | 60.00 | 40.00 | 80.00 | 60.00 | 30.00 | 20.00 | - | - | - | - | 267.80 | 178.40 | 356.80 | 267.60 | 446.00 | 356.80 | 535.20 | 446.00 | 267.60 | 178.40 | | |
| | 5 | - | - | - | - | 26.00 | 14.00 | 36.00 | 24.00 | 46.00 | 34.00 | 56.00 | 44.00 | 36.00 | 24.00 | - | - | - | - | 229.92 | 124.88 | 321.12 | 214.08 | 410.32 | 303.28 | 499.52 | 392.48 | 321.12 | 214.08 | | |
| | 6 | - | - | - | - | 22.00 | 10.00 | 32.00 | 20.00 | 42.00 | 30.00 | 52.00 | 40.00 | 32.00 | 20.00 | - | - | - | - | 196.20 | 107.00 | 249.80 | 196.20 | 329.20 | 285.60 | 428.20 | 374.60 | 196.20 | 107.00 | | |
| | 6 | 41.50 | 30.00 | 58.50 | 47.00 | 75.50 | 64.00 | 92.50 | 81.00 | 109.50 | 98.00 | 126.50 | 115.00 | 21.00 | 9.50 | 370.20 | 267.80 | 521.80 | 419.20 | 679.90 | 570.90 | 821.10 | 722.50 | 976.70 | 874.20 | 1128.40 | 1025.90 | 197.50 | 94.70 | | |
| AP3.5SR | 2 | 32.00 | 20.00 | 49.00 | 37.00 | 66.00 | 54.00 | 83.00 | 71.00 | 100.00 | 88.00 | 117.00 | 105.00 | 31.00 | 19.00 | 285.40 | 178.40 | 437.10 | 330.00 | 668.70 | 461.70 | 740.40 | 533.30 | 892.00 | 785.00 | 1043.60 | 936.60 | 276.50 | 169.50 | | |
| | 3 | - | - | 43.00 | 20.00 | 60.00 | 37.00 | 77.00 | 54.00 | 94.00 | 71.00 | 111.00 | 88.00 | 48.00 | 25.00 | - | - | 393.60 | 178.40 | 636.20 | 330.00 | 696.80 | 491.70 | 699.90 | 639.30 | 960.10 | 796.00 | 428.20 | 223.00 | | |
| | 4 | - | - | - | - | 53.00 | 33.00 | 70.00 | 50.00 | 87.00 | 67.00 | 104.00 | 84.00 | 52.00 | 32.00 | - | - | - | - | 472.80 | 294.40 | 624.40 | 446.00 | 776.00 | 697.70 | 749.30 | 463.80 | 285.40 | 169.50 | | |
| | 5 | - | - | - | - | 47.00 | 22.00 | 64.00 | 39.00 | 81.00 | 56.00 | 96.00 | 71.00 | 63.00 | 38.00 | - | - | - | - | 419.20 | 196.20 | 570.90 | 347.90 | 722.50 | 499.50 | 949.10 | 651.20 | 562.00 | 339.00 | | |
| | 6 | - | - | - | - | 41.50 | 19.20 | 56.20 | 37.00 | 72.20 | 53.00 | 87.20 | 68.00 | 56.20 | 37.00 | - | - | - | - | 353.00 | 231.00 | 517.00 | 311.00 | 633.00 | 417.00 | 785.00 | 517.00 | 311.00 | 169.50 | | |
| | 6 | 52.70 | 42.40 | 76.70 | 66.40 | 100.70 | 90.40 | 123.70 | 113.40 | 149.70 | 139.40 | 173.70 | 176.20 | 28.60 | 18.30 | 470.10 | 378.20 | 694.20 | 582.30 | 898.20 | 806.40 | 1103.40 | 1011.50 | 1335.30 | 1243.40 | 1549.40 | 1462.80 | 295.10 | 163.20 | | |
| AP4SR | 2 | 43.00 | 29.00 | 67.00 | 52.00 | 91.00 | 76.00 | 114.00 | 99.00 | 140.00 | 125.00 | 164.00 | 153.00 | 43.00 | 29.00 | 383.60 | 249.80 | 597.60 | 463.80 | 811.70 | 677.90 | 1016.90 | 883.10 | 1248.80 | 1115.00 | 1462.90 | 1370.10 | 383.60 | 249.80 | | |
| | 3 | - | - | 58.00 | 38.00 | 82.00 | 62.00 | 105.00 | 85.00 | 131.00 | 111.00 | 165.00 | 152.00 | 57.00 | 37.00 | - | - | 517.40 | 389.00 | 731.40 | 563.00 | 936.60 | 789.20 | 1168.50 | 1066.10 | 1362.60 | 1177.40 | 508.40 | 330.00 | | |
| | 4 | - | - | - | - | 66.20 | 41.90 | 86.30 | 62.40 | 106.60 | 82.60 | 132.00 | 118.00 | 72.00 | 48.00 | - | - | - | - | 651.20 | 419.20 | 856.30 | 624.40 | 1068.20 | 866.30 | 1302.30 | 984.60 | 642.20 | 410.30 | | |
| | 5 | - | - | - | - | 64.00 | 33.00 | 87.00 | 56.00 | 113.00 | 82.00 | 137.00 | 108.00 | 66.00 | 55.00 | - | - | - | - | 670.90 | 294.40 | 776.00 | 499.50 | 1008.00 | 731.40 | 1222.00 | 792.10 | 767.10 | 490.60 | | |
| | 6 | - | - | - | - | 52.70 | 21.00 | 69.70 | 40.00 | 84.70 | 55.00 | 107.70 | 78.00 | 67.00 | 43.00 | - | - | - | - | 527.00 | 210.40 | 525.00 | 325.00 | 625.00 | 425.00 | 725.00 | 525.00 | 275.00 | 169.50 | | |
| | 6 | 123.70 | 99.40 | 178.70 | 154.40 | 234.70 | 210.40 | 289.70 | 265.40 | 345.20 | 320.90 | 400.70 | 376.40 | 67.80 | 43.30 | 1103.40 | 886.60 | 1584.00 | 1377.20 | 2093.50 | 1876.80 | 2594.10 | 2377.40 | 3093.70 | 2876.40 | 3574.20 | 3357.50 | 603.00 | 396.20 | | |
| AP5SR | 2 | 110.40 | 66.00 | 158.00 | 121.00 | 214.00 | 177.00 | 269.00 | 232.00 | 324.00 | 287.00 | 380.00 | 343.00 | 101.00 | 64.00 | 1917.80 | 1159.60 | 2894.70 | 2176.50 | 3942.60 | 3184.40 | 4950.60 | 4192.40 | 5971.90 | 5213.70 | 6984.40 | 6226.20 | 1873.20 | 1115.00 | | |
| | 3 | - | - | 136.00 | 87.00 | 192.00 | 143.00 | 247.00 | 199.00 | 302.00 | 253.00 | 356.00 | 309.00 | 135.00 | 86.00 | - | - | 1169.60 | 897.40 | 2176.50 | 1578.30 | 2999.90 | 2069.40 | 3694.50 | 2944.50 | 4389.60 | 3639.60 | 900.90 | 570.90 | | |
| | 4 | - | - | - | - | 170.00 | 109.00 | 225.00 | 164.00 | 280.00 | 219.00 | 335.00 | 275.00 | 169.00 | 109.00 | - | - | - | - | 1516.40 | 972.30 | 2007.00 | 1463.90 | 2602.10 | 1967.90 | 2997.10 | 2463.00 | 1507.50 | 963.40 | | |
| | 5 | - | - | - | - | 148.00 | 75.00 | 203.00 | 130.00 | 259.00 | 186.00 | 314.00 | 241.00 | 203.00 | 130.00 | - | - | - | - | 1320.20 | 868.00 | 1810.90 | 1199.80 | 2305.90 | 1664.70 | 2500.90 | 2149.70 | 1610.80 | 1159.80 | | |
| | 6 | - | - | - | - | 123.70 | 60.00 | 177.00 | 110.00 | 229.00 | 150.00 | 289.00 | 210.00 | 177.00 | 110.00 | - | - | - | - | 1103.40 | 660.00 | 1584.00 | 1011.50 | 2335.30 | 1643.40 | 2549.40 | 1952.80 | 1243.40 | 740.40 | | |
| | 6 | 257.00 | 200.00 | 371.00 | 314.00 | 484.00 | 427.00 | 597.00 | 540.00 | 711.00 | 654.00 | 825.00 | 768.00 | 140.00 | 83.00 | 2292.40 | 1784.00 | 3309.30 | 2600.90 | 4317.30 | 3606.80 | 5325.20 | 4616.60 | 6346.80 | 5636.10 | 7359.00 | 6650.60 | 1249.80 | 740.40 | | |
| AP6SR | 2 | 215.00 | 130.00 | 329.00 | 244.00 | 442.00 | 367.00 | 555.00 | 470.00 | 669.00 | 684.00 | 783.00 | 698.00 | 210.00 | 125.00 | 1917.80 | 1159.60 | 2894.70 | 2176.50 | 3942.60 | 3184.40 | 4950.60 | 4192.40 | 5971.90 | 5213.70 | 6984.40 | 6226.20 | 1873.20 | 1115.00 | | |
| | 3 | - | - | 287.00 | 174.00 | 400.00 | 267.00 | 513.00 | 400.00 | 627.00 | 514.00 | 741.00 | 626.00 | 280.00 | 167.00 | - | - | 2560.00 | 1652.10 | 3568.00 | 2590.00 | 4576.00 | 3588.00 | 5587.00 | 4589.00 | 5801.80 | 4897.60 | 1489.60 | 869.60 | | |
| | 4 | - | - | - | - | 358.00 | 217.00 | 471.00 | 330.00 | 595.00 | 444.00 | 659.00 | 558.00 | 350.00 | 209.00 | - | - | - | - | 3192.40 | 1936.60 | 4301.30 | 2943.80 | 5222.70 | 3944.90 | 6226.10 | 4977.40 | 3123.00 | 1684.30 | | |
| | 5 | - | - | - | - | 316.00 | 147.00 | 429.00 | 280.00 | 543.00 | 374.00 | 627.00 | 486.00 | 420.00 | 251.00 | - | - | - | - | 2818.70 | 1311.20 | 3826.70 | 2319.20 | 4648.00 | 3340.00 | 5960.40 | 4353.00 | 3746.40 | 2238.90 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

RHINO VALVES WORLDWIDE

PNEUMATIC ACTUATOR



INSTRUCTIONS OF INSTALLATION AND MAINTENANCE

INSTALLATION

1. Lubrication: the mobile parts are lubricated in the warehouse and they don't usually require maintenance. However, under extreme conditions of operation, these parts might require re-lubrication.
2. Air supply: the actuator can be supplied with dry or lubricated filtered air. Water or slight oil can also be used. To use with non corrosive gases, please consult our office or distributors
3. Manual operation : when the actuator is totally depressurized, it can be operated with lever or gearbox in the event of an emergency.
4. Adjustment: the actuators have a 90 degrees stopping point which can be adjusted +/-3 degrees through a screw inside the cover by using a screwdriver.

MAINTENANCE

IMPORTANT: BEFORE DISMANTLING MAKE SURE THAT ALL THE AIR AND ELECTRIC CONNECTIONS HAVE BEEN DISCONNECTED.

- A Remove the screws (18) from the ends (3).
- B Removes the ends (3).
- C Rotate the gear (4) counter clockwise to allow the piston to come out from de body.
- D Remove the safety washer (10) from the gear (4).
- E Remove the gear (4) from the lower part of the body by pressing with the fingers from the top.
- F Replace the following parts if necessary:

Pistons (2): O-rings (21) of the piston, nylon guides (20).

Body ends (3): O-rings (19) the body ends

Piston: Ring guides (superior and inferior) (6 and 8), Or-rings (7 and 9).

Note: Internal parts as the cylinder, gear and ring guides should be lubricated with "LITHIUM 2" (Bradford Oil Co.). To re-assemble, follow the previous procedure in the inverse order.