

AUTOMATION SERVICES



Pneumatic & Electric Actuators



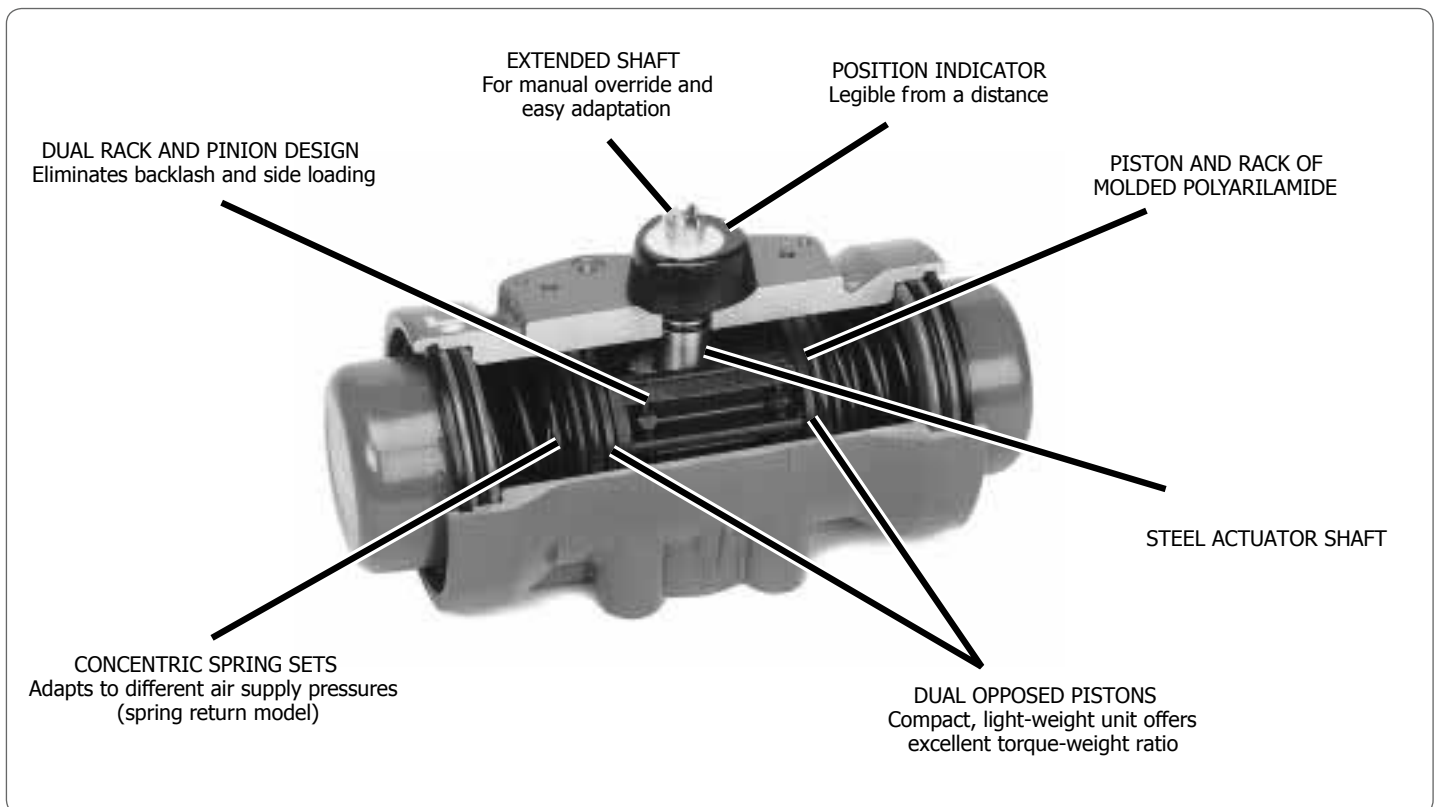
www.americanvalve.com

PNEUMATIC ACTUATORS

INTRODUCTION

FEATURES

- Double piston, double rack and pinion design
 - Constant torque output
 - Compact actuators
 - Balanced internal forces
 - Durability from large teeth engagement
- Choice of three actuator materials for body and end caps
 - Glass-filled polyester
 - 316 stainless steel
 - Cast aluminum with cataphoresis and Rilsan® coating
- Pistons, cylinder guides and racks of one-piece molded Polyaramide resin
 - Corrosion resistant
 - Usable for water service
- Actuator shaft of 303 stainless steel
 - Corrosion resistant inside and outside
- An aluminum pinion with a cataphoresis coating has a square engagement over the full length of the actuator shaft, and gear teeth cut across the full length of the pinion.
 - Massive teeth engagement between rack and pinion
 - Minimal backlash and no play in parts
- Double O-rings seal actuator shaft at top and bottom of actuator
 - Increases internal corrosion resistance and longevity
- Piston guides have large contact area on cylinder wall for maximum support
 - Forces are evenly distributed over large areas of the cylinder walls
 - Pistons efficiently transfer power through racks and pinion
 - Flexibility in selecting fail mode: fail open or fail close
- Concentric spring sets on the spring return unit, single acting or failsafe
 - Actuator can be adjusted to the available air supply pressure
- Extended shaft on actuator top
 - Position indication
 - Manual override feasibility
 - Permits use of accessories such as limit switches or positioners
- Recessed square female drive and square (ISO) bolt circle on bottom of actuator
 - Flexibility in mounting to any style valve
- Top shaft, solenoid block and accessory bolt circle conform to NAMUR standard
 - Allows easy mounting of accessories.



PNEUMATIC ACTUATORS

INTRODUCTION



Our actuators employ a double piston, double rack and pinion design, and incorporate the latest advances in surface coating and parts molding to ensure excellent corrosion resistance and long, trouble-free service.

Three actuator materials are offered: cast aluminum, glass-filled polyester, and 316 stainless steel. The cast aluminum body and end caps are cathodized and Rilsan[®] coated inside and outside. The internal parts are molded from Polyaramide, and the actuator shaft is precision machined from 303 Series stainless steel on certain models.

SAMPLE SPECIFICATION

All American Valve Pneumatic Actuators shall be double piston, double rack and pinion design with body materials of Aluminum (10 mil Nylon coated or Teflon[®] coated) glass-filled polyester or 316 stainless steel. Shaft to be stainless steel with double O-ring sealing. Actuators have 1/4" NPT air connections, visual position indicator. Spring return versions shall have concentric spring sets. All actuators to have ISO bolt circle and NAMUR dimensions for optional accessories .

OPERATION

American Valve pneumatic actuators for quarter-turn ball valves and butterfly valves provide accurate and dependable control, especially in corrosive applications. Pressurized air, water or any other non-aggressive fluid enters via one port and displaces two opposed pistons, transmitting a counter-clockwise quarter turn to the operator shaft and opening the valve. Pressure introduced via a second port reverses this process, transmitting a clockwise turn to close the valve. The units are compact, yet extremely durable. They are available in output torques from 60 to 17,000 inch-pounds at 80 psi.

Double piston, double rack and pinion design results in constant torque output, minimal backlash and extreme durability.

Stainless steel actuator shaft and Polyaramide pistons, cylinder guides and racks provide corrosion resistance in applications with air contamination or when water pressure is utilized.

Concentric spring sets on spring return allow the actuator to be accurately adjusted to the available air supply pressure by adding or removing springs.

ENGINEERING SPECIFICATION

- Body Material: Aluminum, glass-filled polyester, 316 SS
- Shaft: 303 SS w/double O-ring seal
- Temp Range: -25° F to 195° F*
- O-rings: BUNA-N
- Output Torques: 60–17,000 in-lbs
- Supply Air: 60 psi min, 120 psi max
- Air Connections: 1/4" NPT
- Mounting Dimensions: ISO and NAMUR

* For higher temperatures, see the High Temperature actuators on page 8.

MATERIALS OF CONSTRUCTION

American Valve pneumatic actuators are engineered from the finest materials, selected for long wear and corrosion resistance. On the outside, this means protection from adverse environments and corrosive process materials. On the inside, it means more efficient low friction operation and the ability to use water as the power source.

Pistons, guides and racks are molded Polyaramide resin which is impact resistant and long wearing. It is used by American Valve for these key internal parts to achieve corrosion resistance plus durability.

Piston seals, shaft seals and end cap seals are Nitrile O-rings. Nitrile rubber (Buna-N) is a copolymer of Butadiene and Acrylonitrile. In addition to its elastomeric properties, it offers excellent corrosion resistance.

The actuator shafts are 303 Series stainless steel. This provides a smooth machined surface that is corrosion resistant, allowing the actuators to use water as a power source.

PNEUMATIC ACTUATORS

ACTUATOR SELECTION

Pneumatic Actuator Sales Questionnaire

The following questions need to be asked to make a proper recommendation:

- Air to Air or Air to Spring?
- Supply Air Available?
- On/Off, Modulating?
- Solenoid NEMA Rating? IV or VII?
- Environment? Temp, Corrosion Resistance?
- Feedback? Switches IV or VII?
- Positioner? 3–15 psi or 4–20 mA (analogue or digital)?

The advantage of the double piston rack and pinion design lies in its accurate translation of linear to rotary torque. That is why most automobiles have switched to rack and pinion steering. The rack and pinion design provides the most accurate translation of linear to rotary motion, for both on-off and positioning modes. A major advantage of the double acting rack and pinion design is constant torque output throughout its travel. Other designs, such as the Scotch Yoke, possess an undulating torque curve, making actuator sizing complex.

Torque output on Spring Return models varies according to the compression rate of the springs. Output torque decreases on the air stroke as the springs are compressed, and it decreases in the spring stroke as the springs relax and extend. Reference the torque chart on page 5. Use this to determine the correct number of springs required for your application.

TORQUE AND AIR PRESSURE

Two items of information are required in order to select the appropriate size actuator:

1. Valve breakaway torque: The amount of torque (in inch-pounds) required to "break" the ball, plug or disc away from the seat is the valve breakaway torque. It is calculated from the pressure differential, type of media, con-

tact area between sealing members, etc. The resultant calculation is then multiplied by a safety factor to take into account unknowns such as the time the valve has been in the closed position (certain sealing materials may take a set, making them difficult to separate) and corrosion buildup.

2. Air supply pressure (psig): A conservative approach is necessary. An actuator located adjacent to the compressor may receive a full 80 psi air supply. However, an actuator located 100 yards and several valves and leaky fittings away from the source may see only 60 psi air. If a valve's required torque equals an actuator's maximum torque output, the next largest actuator should be selected.

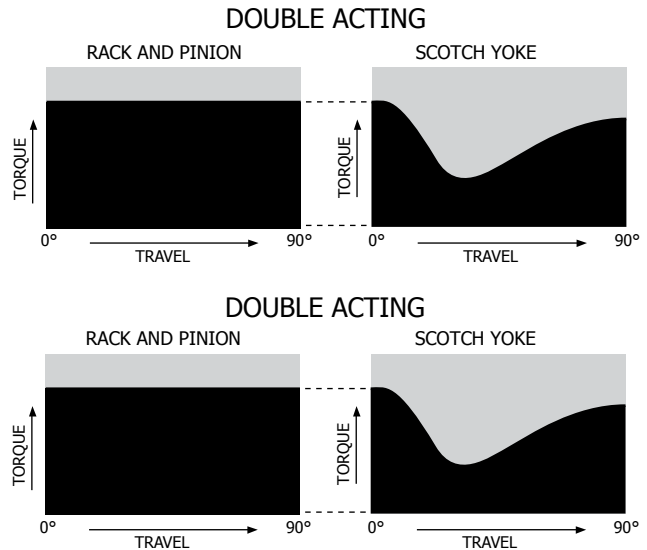
EXAMPLES OF PNEUMATIC ACTUATOR SELECTION

Select the actuator where torque output at a given air pressure exceeds the required valve torque. It is recommended that you increase actual valve torque by a 25% safety factor.

EXAMPLE 1

Air-to-Air

SPECS: Valve torque = 1200 in-lbs
Air supply = 80 psig
ANSWER: Actuator = D579P



EXAMPLE 2

Spring Return—Fail Closed

Select the actuator possessing a torque output at the minimum air supply pressure at spring end and air start that exceeds the torque required to close the valve.

SPECS: Valve torque = 1480 in-lbs
Air pressure = 80 psig
FIND: Spring end = 1912 in-lbs
FIND: air start @ 80 psig = 4886 in-lbs
ANSWER: Actuator = F79PS
NOTE: Actuator is modified to 2 springs on each side.

EXAMPLE 3

Spring Return—Fail Open

Select the actuator possessing a torque output at the minimum air supply pressure at the spring start and air end stroke that exceeds the torque required to open the valve.

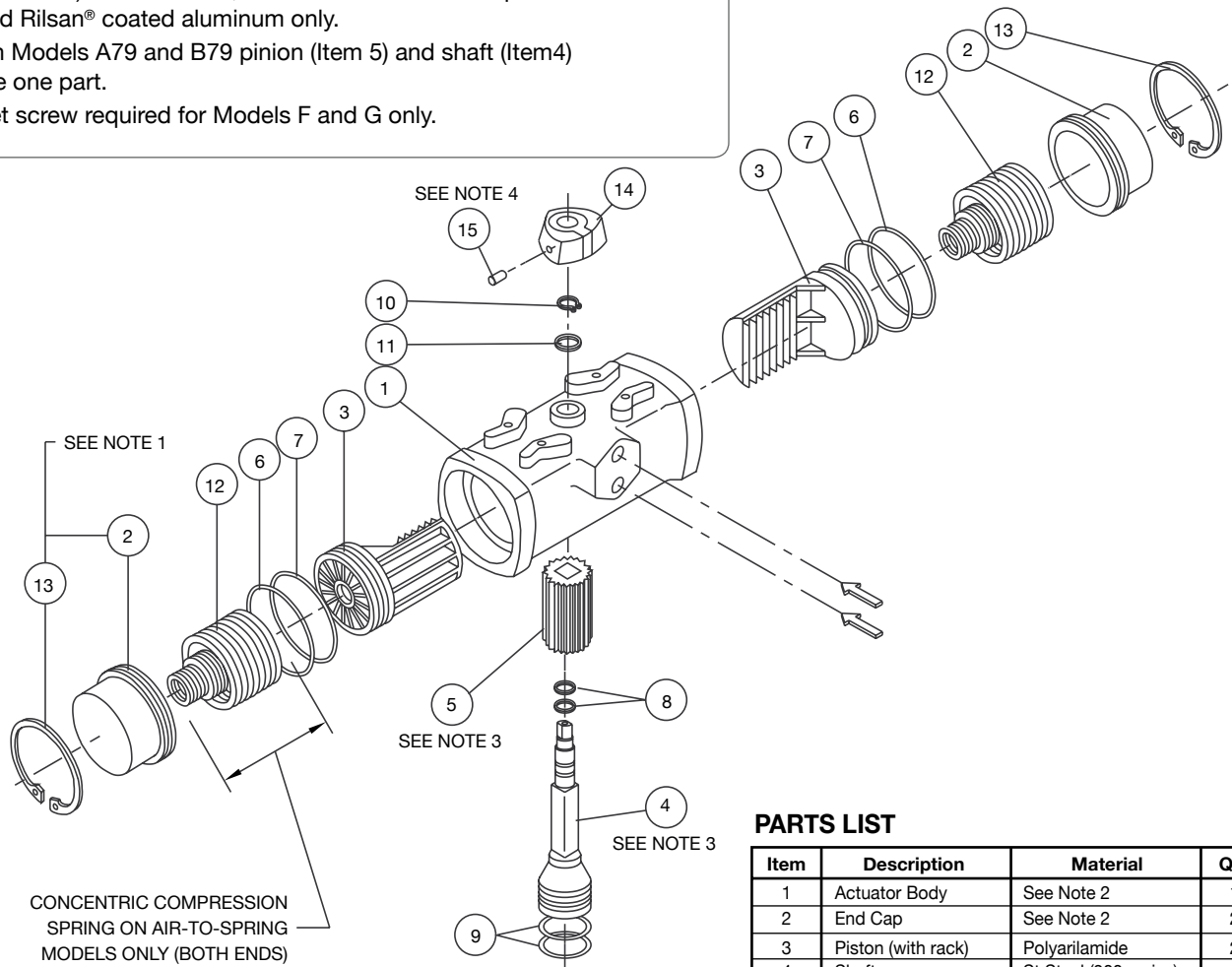
SPECS: Valve torque = 1480 in-lbs
Air pressure = 80 psi
FIND: Spring start = 2456 in-lbs
FIND: air end @ 80 psig = 4342 in-lbs
ANSWER: Actuator = F79PS
NOTE: Actuator is modified to 2 springs on each side.

PNEUMATIC ACTUATORS

ENGINEERING DATA

NOTES:

1. Illustration shows an air-to-spring model. Air-to-air model is similar except springs (Item 12) are omitted and end caps (Item 2) are different.
2. Actuator body (Item 1) and end caps (Item 2) are polyester glass filled for Models AP79P, BP79P, CP79P and DP79P (also available in 316 SS and cataphoresis and Rilsan® coated aluminum). Models E79P, F79P and G79P are cataphoresis and Rilsan® coated aluminum only.
3. On Models A79 and B79 pinion (Item 5) and shaft (Item 4) are one part.
4. Set screw required for Models F and G only.



PARTS LIST

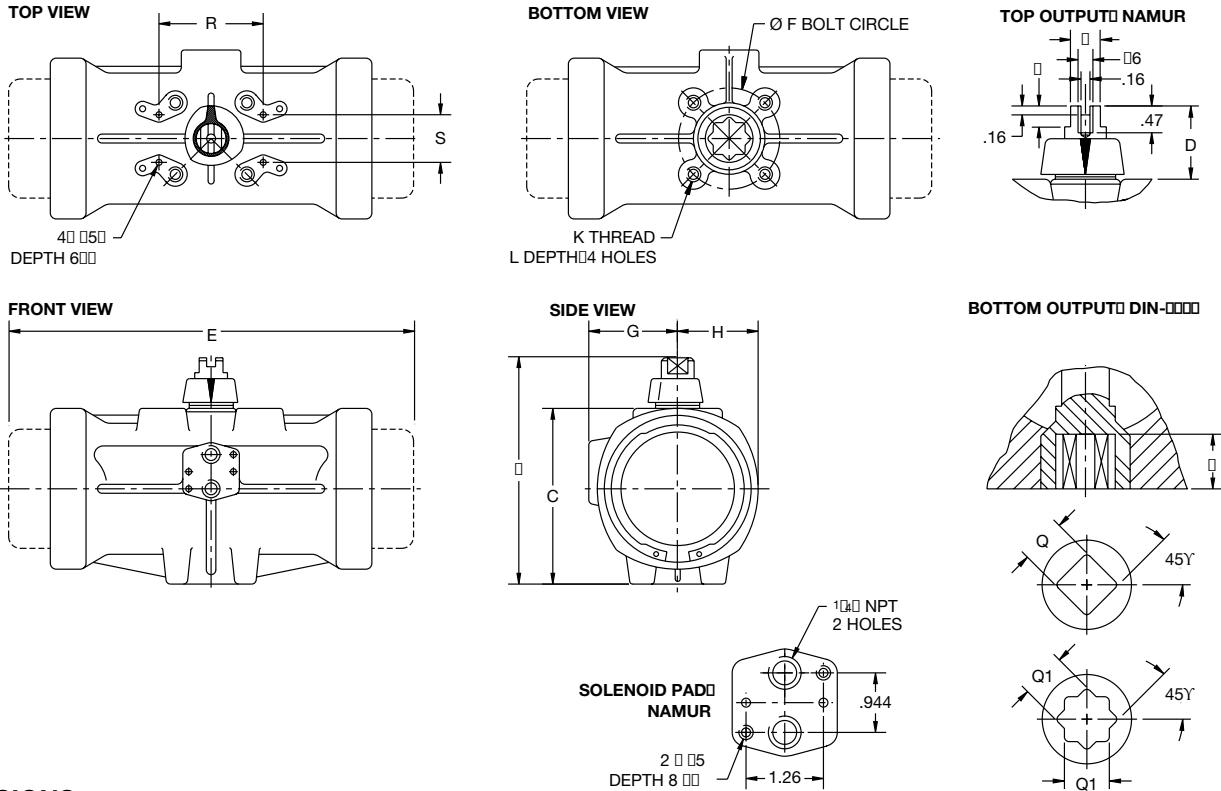
Item	Description	Material	Qty
1	Actuator Body	See Note 2	1
2	End Cap	See Note 2	2
3	Piston (with rack)	Polyaramide	2
4	Shaft	St Steel (300 series)	1
5	Pinion	Aluminum with Cataphoresis Coating	1
6	O-Ring (end cap)	Nitrile BUNA-N	2
7	O-Ring (pistons) N	itrile BUNA-N	2
8	O-Ring (shaft top)	Nitrile BUNA-N	2
9	O-Ring (shaft bottom)	Nitrile BUNA-N	2
10	Retaining Ring (shaft)	St Steel (300 series)	1
11	Flat Washer	Polyamide	1
12	Spring Set	Steel with Cataphoresis Coating	2
13	Retaining Ring (end cap)	Steel with Cataphoresis Coating	2
14	Position Indicator	Polyamide	1
15	Set Screw	Stainless Steel	1

WEIGHT (POUNDS)

Model No.	Aluminum		PEG		316 SS	
	A-A	A-S	A-A	A-S	A-A	A-S
A79P	1.08	1.43	.73	1.03	N/A	N/A
B79P	2.30	2.90	1.70	2.30	4.6	5.1
B579P	3.10	4.20	N/A	N/A	N/A	N/A
C79P	4.10	5.70	3.10	4.70	8.4	9.9
C579P	5.70	8.60	N/A	N/A	N/A	N/A
D79P	7.90	12.70	.50	10.90	5.6	19.5
D579P	13.00	20.20	/A	N/A	N/A	N/A
E79P	19.40	35.90	/A	N/A	N/A	N/A
F79P	42.80	71.40	/A	N/A	N/A	N/A
G79P	77.00	35.50	N/A	N/A	N/A	N/A

PNEUMATIC ACTUATORS

ENGINEERING DATA



DIMENSIONS (INCHES)

Actuator Model	C	D	E		F	G	H	J	K	L	Q	Q1	R	S	X	Y	Z*
			A-A	A-S													
A79P	2.56	0.78	4.21	5.55	1.65	1.47	1.21	3.34	5 mm	0.39	0.433	0.433	3.15	1.18	0.31	0.29	0.51
B79P	3.15	1.18	4.92	5.86	1.96	1.73	1.42	4.43	6 mm	0.47	0.787	0.787	3.15	1.18	0.39	0.43	0.55
B579P	3.62	1.18	5.75	7.64	2.75	2.08	1.38	4.80	8 mm	0.47	0.944	0.944	3.15	1.18	0.39	0.43	0.55
C79P	3.82	1.18	7.00	8.74	2.75	1.97	1.85	5.00	8 mm	0.59	0.944	0.944	3.15	1.18	0.39	0.43	0.55
C579P	4.64	1.18	8.03	10.07	2.75	2.36	1.85	5.83	8 mm	0.59	0.944	0.944	3.15	1.18	0.39	0.43	0.55
D79P	5.16	1.18	9.21	11.49	2.75	2.56	2.36	6.34	8 mm	0.59	1.100	0.944	3.15	1.18	0.63	0.39	0.86
D579P	6.34	1.18	10.87	14.37	4.02	3.07	2.91	7.52	10 mm	0.79	1.181	1.181	3.15	1.18	0.63	0.39	1.18
E79P	7.09	1.18	12.12	18.50	4.02	3.54	3.07	8.26	10 mm	0.79	1.181	1.181	3.15	1.18	0.63	0.39	1.18
F79P	8.86	1.97	16.46	25.28	4.92	4.13	3.78	10.80	12 mm	0.79	1.417	1.417	5.12	1.18	1.26	0.83	1.50
G79P	10.71	1.97	20.63	27.32	5.51	5.20	4.76	12.05	16 mm	0.98	1.417	1.417	5.12	1.18	1.26	0.83	1.50

*Dimension shown for square output. (For depth of Star Drive consult Factory.)

AIR CONSUMPTION (CUBIC INCHES)

Model No.	Air to Air		Air to Spring
	Open Port A	Close Port B	Air Stroke
A79P	4.58	3.05	4.58
B79P	9.15	6.10	9.15
B579P	15.90	12.20	15.90
C79P	21.40	19.50	21.40
C579P	35.40	34.80	35.40
D79P	48.80	42.70	48.80
D579P	91.50	73.20	91.50
E79P	125.00	116.00	125.00
F79P	243.00	219.00	243.00
G79P	640.00	427.00	640.00

CYCLE TIME (SECONDS PER STROKE)

Model No.	Air to Air		Air to Spring	
	Open Port A	Close Port B	Open Port A	Close Port B
A79P	0.10	0.10	0.15	0.3
B79P	0.15	0.15	0.20	0.4
B579P	0.20	0.20	0.40	0.8
C79P	0.25	0.25	0.60	1.1
C579P	0.30	0.30	1.00	1.5
D79P	0.40	0.40	1.70	2.0
D579P	0.50	0.50	2.70	3.9
E79P	0.60	0.60	3.80	5.5
F79P	1.20	1.20	5.80	12.0
G79P	2.00	2.00	18.20	19.0

Note: Actuator supplied with 80 psi and no load

ELECTRIC ACTUATORS

INTRODUCTION



For over 15 years American Valve has been at the forefront of quarter turn valve technology. The American Valve line is the broadest in the industry in terms of size, range, valve types, materials, features and options.

Today American Valve is on the leading edge of electronic valve control. We offer a full line of electric actuators, from the no-frill unidirectional Electromni to the reversing motor Quarter Master Series, as well as extensive customization services and all the latest options and accessories.

Our in-house manufacturing and design capabilities offer our customers several unique advantages.

FLEXIBILITY

We can customize our electric actuators to suit a customer's needs precisely. We are of a size and orientation that allow us to make changes quickly in response to fluctuating customer requirements.

QUALITY CONTROL AND ENGINEERING STANDARDS

American Valve has been active in the valve automation industry for over 10 years. A major part of our success can be attributed to the rigid standards we have set for ourselves.

- **Minimum Design Life:** For our electric actuators it is 250,000 cycles.
- **Traceability:** Each actuator receives a serial number so that it may be tracked to its original parts. Actuators are signed off by the assembler and production supervisor.
- **Inspection:** All parts are inspected as they are received by the Assembly Department.
- **Cycle Testing:** Our actuators are thoroughly cycle-tested. We do more than random sample testing. We test 100% of our actuators to make sure they will perform to your satisfaction.

SERVICE

Our extensive inventory of parts and complete units enables us to provide fast turnaround on customer orders. Since we design and manufacture the product, we can provide exceptional technical support for installation and troubleshooting on all our actuated Products.

ELECTRIC ACTUATORS WHEN TO SPECIFY THEM

There are four primary reasons to specify Electric versus Pneumatic Actuators.

- 1. No Air Supply:** For large outdoor sites, water and wastewater treatment ponds, tank farms, mines. Often there is simply no compressed air supply available.
- 2. Cold Ambient Temperature:** In areas where temperatures are frequently below freezing, compressed air systems are vulnerable to frozen water in the lines. Electric actuators, with heaters and thermostats, can supply trouble-free service even when surrounding temperatures reach -40° F.
- 3. Computer Controlled Processes:** In the past, standard engineering practice called for pneumatically operated valves even when the rest of the process was electronically controlled. This required a conversion from electric to pneumatic, usually through an I/P transducer or, more recently, through an I/P positioner. This conversion made systems more complex, more complicated to start up and to maintain calibration, and more expensive. With the increasing popularity of distributed control systems, process and instrumentation engineers are specifying fully electronic systems.
- 4. Lower Installation Cost:** The cost to equip a plant with a compressed air system (compressor, regulators, air lines) just to automate a few valves far exceeds the cost of using electrically actuated valves. Electric wire and switches are all that is needed.

ELECTRIC ACTUATORS

INTRODUCTION

BASICS

An electric motor consists of a rotor, an electrical winding, and a gear train. When the power is supplied to the winding, a magnetic field is created which makes the rotor spin. The rotor is coupled to gears in the gear train. The output shaft of the gear train is directly coupled to the valve stem since it produces rotary motion. The rotor will stop turning when the power to the winding is cut. The electrical switches in the power supply control the limits of travel. These limit switches are tripped by cams, which rotate with the actuator shaft. Since the cams are adjustable, precise open and closed positions can be set.

The gear train or gear box determines the cycle time of an electric actuator. The speed of cycling is only adjustable by changing the gear set or installing a cycle length control timer.

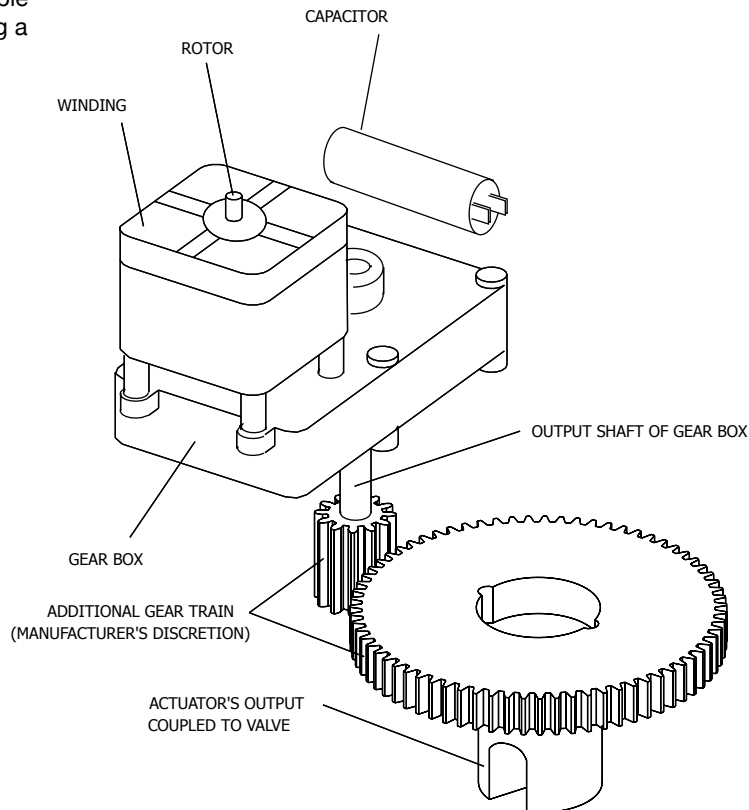
UNI-DIRECTIONAL ACTUATORS

One-way motors travel in one direction only and stop every 90° or 180°, until signaled to move.

These single coil, on/off actuators are adequate for some ball valve applications in which the valves require alternate opening and closing.

REVERSING MOTORS

Reversible motors open the valve in one direction and close the valve in the reverse direction. Dual coil actuators are well suited for precise control of flow, since the actuator does not have to travel through the full stroke to start the reverse stroke. For example, one coil controls the counter-clockwise rotation or open cycle while the other coil, mounted on the opposite side around the rotor, controls the clockwise or close cycle. In order to control the direction of rotation, the appropriate coil needs to be energized. This actuator can be used with all valve styles, and travel can be adjusted for a specific valve by adjustments of cams that control limit switches, such as 180° travel with multiport or three-way valves.



Note: Some actuator's output can be coupled directly from output shaft of gear box to valve.

ELECTRIC ACTUATORS

QUARTER MASTER CHIEF SERIES 92

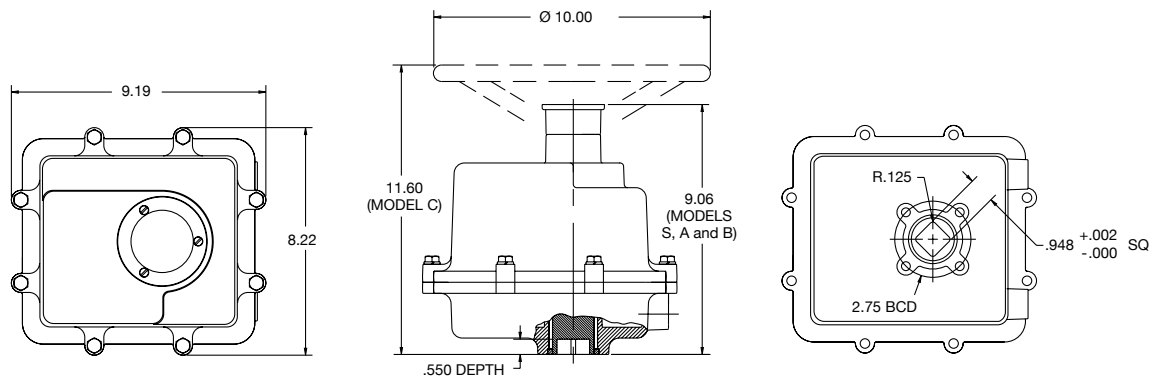


FEATURES

- Reversing type motor, 115 Vac, 50/60 Hz, single phase
- Brushless, capacitor-run motors (AC models)
- Integral thermal overload protection with auto-reset (AC models)
- Permanently lubricated gear train
- Thermally-bonded epoxy powder coating with stainless steel trim
- ISO bolt circle
- Two 1/2" NPT conduit ports prevent interference between control and power signals
- Visual position indicator (beacon); valve position visible from a distance
- Dec clutchable manual override easily employed by pulling up on indicator knob and inserting wrench onto flats of stem
- Standard travel-stop limit switches can simultaneously be used for light indication
- Combination NEMA 4X, 7 and 9 enclosure
- Corrosion resistant mounting
- Duty cycle 100% at 10 seconds
- All 115 Vac and 220 Vac motors are CE marked

OPTIONS

- Limit Switches: Two additional limit switches may be mounted in the Series 92 for interlocking other equipment, such as pumps, compressors, mixers, or other valves
- Feedback Potentiometer: When control operation or position feedback information is needed, a 1000 ohm, 1 watt potentiometer with 5% linearity may be installed
- Heater and Thermostat: For operation at low temperature (to -40° F). Also used to combat condensation in high humidity areas. The combination of heater and thermostat will maintain the temperature of the case at 40° F. When specified, heater and thermostat come internally wired in the actuator.
- Milliamp Positioner: An all solid state electronic positioner can be installed inside the housing of the Series 92. Standard 4–20 milliampere input signal, or optional 1–5 and 10–50 milliampere, 0–10 Vdc are available. The positioner will give low cost, all electric modulating control capability.
- Voltages: 12, 24, 220 Vac; 12, 24 Vdc
- Center Off Operation: Allows for off or 90° position on 3-way valves
- Mechanical Brake: Eliminates oscillation when seating butterfly valves



ENGINEERING DATA

Model	Torque (in-lbs)	115 Vac		220 Vac		12 Vdc		24 Vdc		12 Vac		24 Vac		Cycle Time/90° (sec)	Weight (lbs)
		Amp Draw	Duty Cycle	Amp Draw	Duty Cycle	Amp Draw	Duty Cycle	Amp Draw	Duty Cycle	Amp Draw	Duty Cycle	Amp Draw	Duty Cycle		
S92	400	.50	100%	.8	75%	2.0	75%	4.0	75%	2.0	75%	3.0	75%	10	15.3
A92	700	.75	75%	.8	50%	2.0	75%	4.0	75%	2.0	75%	3.0	75%	10	15.3
B92	1100	.50	100%	.8	75%	2.0	75%	4.0	75%	2.0	75%	3.0	75%	25	15.5
C92	2000	1.00	50%	.8	50%	2.0	75%	4.0	75%	2.0	75%	3.0	75%	25	18.3

Notes: All Amp ratings are considered locked rotor.
Duty cycles are for ambient temperature (73° F).

ELECTRIC ACTUATORS

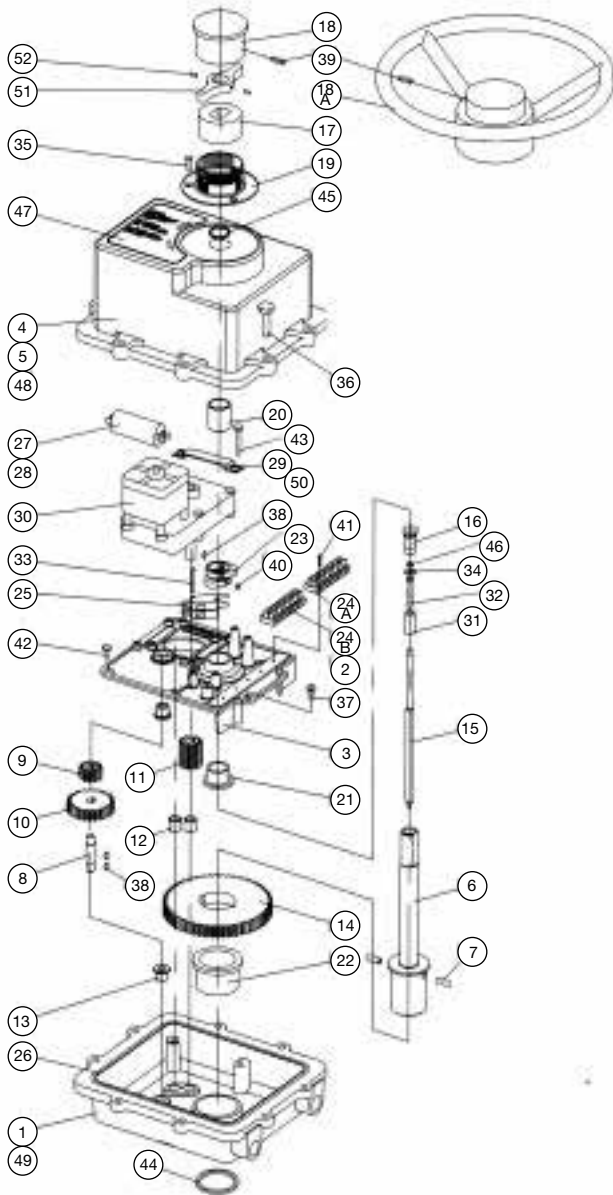
QUARTER MASTER CHIEF SERIES 92

SAMPLE SPECIFICATION

All Series 92 Electric Actuators shall be reversing type, capacitor run motor design, thermally protected with a permanently lubricated gear train. Actuator to have heat treated solid metal gearing in a die cast aluminum housing with a baked hybrid epoxy coating and stainless steel trim which meets NEMA 4X, 7 and 9 enclosure ratings. Each actuator to have a manual override, visual position indication and ISO standard mounting bolt circle as manufactured by American Valve, Inc.

ENGINEERING SPECIFICATIONS

- Size: S92, A92, B92, C92
- Torque: 400-2000 in-lbs
- Voltage: 120 Vac, 50/60 Hz
- Amp Draw: S92, B92: .5 Amps, A92: .75 Amps, C92: 1.0 Amp
- Conduit Entry: 1/2" NPT
- Max Ambient Temp: 150° F
- Switches: 2 single pole, double throw (15 Amp rating)
- Cycle time 90°: S92, A92: 10 seconds, B92, C92: 25 seconds



Item No.	Part No.	Quantity				Description
		S92	A92	B92	C92	
1	7401920	1	1	1	1	Base
2	7401440	1	1	1	1	Wiring Harness-4 pcs
3	7401060	1	1	1	1	Base Plate
4	7401940	1	1	1	1	Cover
5	7401925	1	1	1	1	Wiring Diagram Label
6	7401900	1	1	1	—	Shaft Main
6A	7401905	—	—	—	1	Shaft Main
7	7401360	2	2	2	2	Pin
8	7401280	—	—	1	1	Shaft Stub
9	7402003	—	—	1	1	Spur Gear 1B
10	7402002	—	—	1	1	Spur Gear 1A
11	7401400	1	1	1	1	Gear Pinion
12	7401540	1	1	1	1	Bearing Pinion
13	7402006	—	—	2	2	Bearing Fl-Spur Gear
14	7401380	1	1	1	1	Gear Main
15	7401200	1	1	1	—	Shaft Inner
15A	7401210	—	—	—	1	Shaft Inner
16	7401180	1	1	1	1	Shaft Retainer
17	7401300	1	1	1	1	Knob Lower
18	7401320	1	1	1	—	Knob Upper
18A	7401995	—	—	—	1	Handwheel
19	7401260	1	1	1	1	Collar
20	7401120	1	1	1	1	Bearing Upper Cover
21	7401080	1	1	1	1	Base Plate Bearing
22	7401020	1	1	1	1	Base Bearing
23	7401480	2	2	2	2	Cam
24A	7401420	1	1	1	1	Terminal Block 1-8
24B	7401425	1	1	1	1	Terminal Block 9-16
25	7401460	2	2	2	2	Switch Actuator
26	7401560	1	1	1	1	O-Ring Base/Cover
27	7402948	1	—	1	—	Capacitor 4.2 mFD
27A	7402004	—	1	—	—	Capacitor 6.7 mFD
28	7403008	—	—	—	1	Capacitor 7.6 mFD
29	7401520	1	1	1	1	Clamp Capacitor
30	7401340	1	1	1	1	Motor
31	7401250	1	1	1	1	Shell
32	7401220	1	1	1	—	Spring
32A	7401230	—	—	—	1	Spring
33	7401620	2	2	2	2	Screw Round Hd 4-40 x 1.00 Lg
34	7401240	1	1	1	1	Washer, Flat #10 .45 Dia x .06 Thk
35	7401680	3	3	3	3	Screw Flat Hd 8-32 x .25 Lg SS
36	7401640	8	8	8	8	Screw Hex Hd 5/16-18 x 1.0 Lg SS
37	7401521	1	1	1	1	Screw Self Tap (green) #10 x .5 Lg
38	7401880	1	1	3	3	Key, Woodruff 3/32
39	7401700	1	1	1	1	Screw Slot Set 8-32 x .5 Lg SS
40	7401740	4	4	4	4	Screw Set 8-32 x .12 Lg
41	7401600	4	4	4	4	Screw Self TAP #4 x .5 Lg
42	7401660	5	5	5	5	Screw Self Tap/Slot #10 x .5 Lg
43	7401720	4	4	4	4	Screw Slot/Hex 10-32 x 1.62 Lg
44	7401040	1	1	1	1	Seal Base
45	7401140	1	1	1	1	Seal Cover
46	7401580	1	1	1	1	O-Ring Shaft
47	7401950	1	1	1	1	Override Label
48	7401960	1	1	1	1	Cover Nameplate
49	7401970	1	1	1	1	Base Nameplate
50	7401430	1	1	1	1	Capacitor Harness-2 pcs
51	7401485	—	—	—	1	Handwheel Cam
52	8100179	—	—	—	2	Cam Screw Set 1/4-20 x .25 Lg

ELECTRIC ACTUATORS

RCEL ACTUATORS (FOR 6"-10" VALVES)

PERFORMANCE

TYPE	Max. Output Torque In. Lbs.	Operating Time 60/50 hz 90 Deg.	Duty Cycle 30 min. Thermally Protected	Rated Current (Amps)				Number of Handle Turn	Weight Lbs.
				1 Phase		3 Phase			
				120vac	220vac	380vac	440vac		
RCEL - 38	3298	20/24	100%	1.95/3.75	1.26/1.85	0.36/0.80	0.37/0.87	12.5	40
RCEL - 60	5208	24/29	80%	3.10/4.90	1.50/2.34	0.56/1.27	0.57/1.36	12.5	49
RCEL - 80	6944	24/29	70%	4.10/7.50	2.15/3.70	0.84/1.76	0.78/1.88	14.5	51

OPTIONAL ITEMS

EXP	Explosion & Water Proof Enclosure Class I C & D / Class II E, F & G Exd IIB T4 IP67
DCM	24 VDC Motor (RCEL-6 thru RCEL-28)
ACM	24 VAC Motor (RCEL-6 thru RCEL-28)
ALS	Auxiliary Limit Switches 2 SPDT Switches (6 aux switches max)
EXT	Extended Travel Angle 120° to 360° (RCEL-6 thru RCEL-100)
LCU	Local Control Unit (NEMA-4) Local/Remote Selector Switch Open/Stop/Close Selector Switch
LCU w/Key	Local Control Unit (NEMA-4) with Key Lock
PIU	1K Ohm Feedback Potentiometer
CPT	Current Position Feedback Transmitter 4-20mA DC Output
DCT	VDC Position Feedback Transmitter 1-5vdc, 0-5vdc and 0-10vdc
PCU	Proportional Control Unit 4-20mA, 1-5VDC or 0-10VDC Input
IMS	Integral Motor Starter Includes Reversing Contactors and Step Down Transformer
CLC	Repeat Cycle Timer For Cycle Length Control
ATS	Auxiliary Torque Switches 2 SPDT Switches (RCEL-15 thru RCEL-250)

* Please consult factory when adding more than 1 option.

STANDARD SPECIFICATIONS

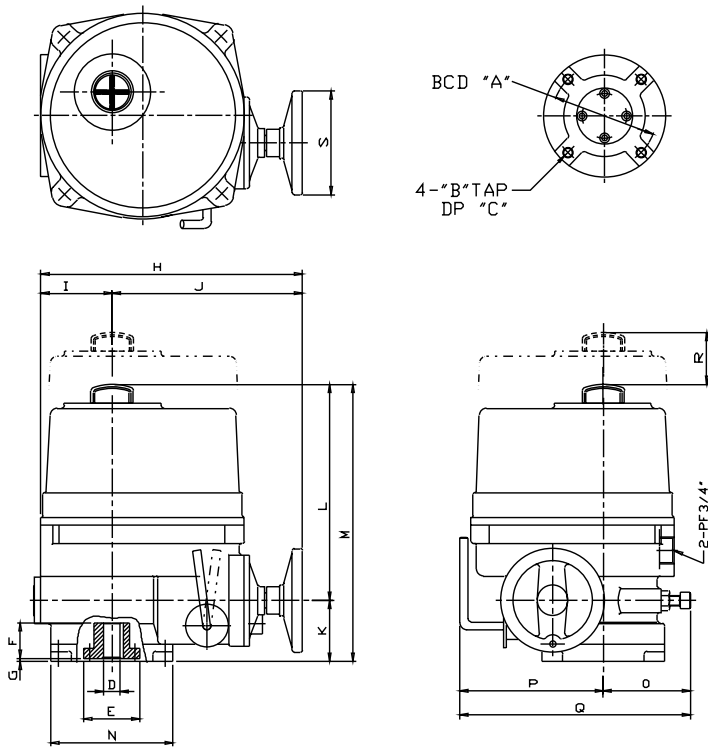
Enclosure	Watertight IP67, Nema 4 and 6
Ambient Temp.	From -20° to +158° Fahrenheit 300°Fahrenheit for 1hour
Power Supply	120/220VAC 1-Phase 380/440VAC 3-Phase
Control Power	110/220VAC 1-Phase, 60/50Hz
Duty Cycle	See Performance Chart
Torque Switches	(2) Open/Close (RCEL-15 thru RCEL-250)
Limit Switches	(2) Open/Close, 250 VAC 16A Rating
Stall Protection	Internal Thermal Protection Open 300°F/Close 207°F
Travel Angle	90° ± 5°
Indicator	Continuous Position Indicator
Manual Override	HAND/AUTO Decutching Mechanism
Self Locking	Provided by means of Worm Gearing
Mechanical Stops	External Adjustable Screws
Space Heater	20Watt (24/120/220 VAC and 24 VDC) Anti-Condensation
Conduit Entries	Two 3/4" NPT.
Lubrication	Grease Moly (EP) Type
Materials	Steel, Aluminum Alloy, Aluminum Bronze
Surface Treatment	Anodizing
External Coating	Dry Powder, Epoxy-Polyester

ELECTRIC ACTUATORS

RCEL ACTUATORS (FOR 6"-10" VALVES)

DIMENSIONS

RCEL-38, 60 and 80



MODEL	RCEL-38	RCEL-60	RCEL-80
ISO 5211 FLANGE	F-10 / F-12	F-12 / F-14	
A	4.02 / 4.92	4.92 / 5.51	
B	M10 / M12	M12 / M14	
C	.71	.87	
D	1.26	1.65	
E	2.95	3.35	
F	2.05	2.32	
G	.08	.08	
H	11.22	12.8	
I	3.27	3.9	
J	7.95	8.9	
K	2.76	3.07	
L	9.84	11.14	
M	12.6	14.21	
N	5.71	6.89	
O	3.9	4.57	
P	6.26	7.52	
Q	10.16	12.09	
R	5.12	7.01	
S	4.92	6.69	
T	NA	NA	
U	NA	NA	
X	NA	NA	
Y	NA	NA	
Z	NA	NA	

"B" dimension is metric. All other dimensions are shown in inches.