

ACTUATION



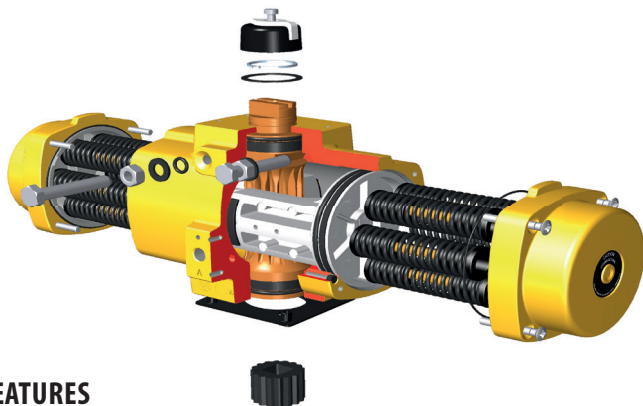
PNEUMATIC ACTUATORS

new AD & AS (sizes 0025 - 0350)

APOLLO RACK & PINION

Designed and manufactured for the ultimate in durability and reliability, the new Apollo® Pneumatic Rack & Pinion Actuators provide outstanding service life.

Apollo Rack & Pinion actuators have replaceable insert drive adapters in all but the largest models, and many units have dual "F" series bolt patterns. The numerous actuator drive and bolt pattern combinations allow direct mounting of several valve styles.



FEATURES

1. **Cast Aluminum Body**
Yellow Chromate Powder Coat Finish
2. **Die Cast Aluminum End Caps**
Yellow Chromate Powder Coat Finish
3. **Die Cast Aluminum Pistons**
Hard Anodized
4. **Aluminum Alloy Pinion**
Hard-coat Anodized Finish
5. **Drive Inserts**
Extruded Aluminum
Hard-coat Anodized Finish
6. **Preloaded Concentric Springs**
Delta-Tone® Coated
7. **Bushings**
Polyoxymethylene (POM)
8. **O-Ring Seals**
Standard Temp. (-4°F to 180°F): Buna-N
High Temp. (-4°F to 250°F): Fluorocarbon
Low Temp. (-40°F to 180°F): Silicone
9. **Capscrews, Nuts & Other Hardware**
Stainless Steel or Delta-Tone® Coated

BENEFITS

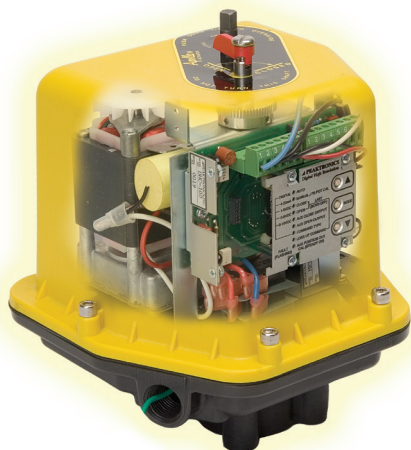
- Compact Rack & Pinion Design
- Quarter-Turn Operation
- Designed for use on a variety of Valve Types:
Ball Valves, Butterfly Valves, Plug Valves
- Applicable to Damper and Door Openers
- Both Double-Acting and Spring-Return Units
- Double-Acting Torque Outputs from 220 in-lbs to 3547 in-lbs with an 80 psi Air Supply
- Removable/Replaceable Drive Inserts*
- Pre-loaded Spring Assemblies
- ISO 5211 Valve Mounting
- NAMUR (VDI/VDE 3845) Accessory Mounts
- ATEC Classification II, 2 GD, Zones 1 or 2 (Gases) and 21 or 22 (Dust)
- Anti Blow-Out Pinion Design
- Maximum Pressure Rating: 116 psig (8 bar)
- Compatible Media: Clean, Dry Air, Filtered
Non-corrosive Gas or Light Hydraulic Oil
- Pre-lubricated for the life of the Actuator
- Chromate Corrosion Protection on all Aluminum Components
- Each Unit is Serialized
- 5 Year Apollo Warranty**

Notes:

* A wide selection of standard inserts is available for Square, DIN and Double-D drives.

APOLLO RACK & PINION NUMBERING SYSTEM

A	S	0350	N	04	A	C	A
PREFIX	ACTION	SIZE	SEAL OPTION	SPRING SET	INSERTS	FAIL POSITION	REVISION
A	D = DOUBLE ACTING S = SPRING RETURN K = KIT	0025 0040 0065 0100 0150 0200 0350	N = NITRILE H = FLOUROCARBON L = SILICONE	00 (DA) 02 03 04 05 06 08	A = STANDARD SQUARE B = WITHOUT INSERT	C = FAIL CLOSED (FC) F = FAIL OPEN (FO) D = NO SPRING	A



Ruggedly built and designed for easy installation, new Apollo® AE Series electric actuators deliver the most standard features and performance in their class. **Now CSA listed all sizes as standard.**

FIVE OUTPUT TORQUES, ONE HOUSING

- 200, 400, 600, 800 and 1,000 inch-pounds
- Long Service Life
- Anodized die cast aluminum housing
- Fiberglass reinforced nylon cover resists corrosion
- Nitrile gasket and seals cover all penetration points in housing and cover
- Precision cut and heat treated alloy spur gears
- Permanently lubricated enclosed gear train
- NEMA 4, 4X

EASY TO USE

- Two separate 1/2" NPT conduit entrances for easier wiring and signal separation
- 12-position pre-wired terminal strip includes standard connections for remote open/closed position indicators; lots of room for wiring options
- Unrestricted mounting orientation
- Built-in thermal overload protection in all AC motor actuators
- Limit switches have an 11 amp rating at 115 VAC
- High visibility valve position indicator standard on all models

MANY STANDARD FEATURES

- Stainless steel push-and-turn manual override shaft, position indicator shaft and female output
- ISO 5211 F07 drive output reduces inventory of mounting kits
- 115 AC & 220 AC models feature a 25% duty cycle below 100°F (24AC — 20% duty cycle below 100°F)
- 12 and 24 DC — all DC voltage models provide 100% duty cycle for 1 hour after which DC motor is reduced to 80% duty cycle
- Reversible rotation

BROAD TEMPERATURE RANGE

- Operates from -40°F (when equipped with 15 watt heater and thermostat) to 150°F

AVAILABLE OPTIONS

- Actuators can be ordered with one, two or three additional limit switches
- For low temperatures: actuators can be equipped with a thermostatically controlled heater element
- Motor brake is necessary when mounting actuator to a butterfly valve

4-20MA POSITIONER FEATURES (P - OPTION)

Advanced Protection Features

- A) Stall Detection - Motor will not burn out from stalling
- B) Fault Signal
 - Fault LED on DHC-100 front panel
- C) Duty Cycle Protection
 - Allows actuators rated for 25% duty, or more, to be safely modulated
 - Activates prior to tripping of thermal overload protector, which prevents long shut down periods due to tripping thermal overload protector; allows the actuator to continue to move to set-point at a 25% duty cycle speed

Performance Features

- A) High Resolution ($\pm 0.1^\circ$)
 - 450 points of resolution on a 1/4 turn valve
- B) Dynamic Braking
 - Stops motor before changing actuator direction
 - Stops motor before mechanical brake engages, which reduces break wear
- C) Adaptive Control - Designed to maintain high resolution and accuracy by continuously monitoring and compensating for actuator backlash, motor coast, and load changes to eliminate positioner deadband

4-20MA POSITION TRANSMITTER FEATURES (T - OPTION)

- A) High Resolution Feedback Transmitter
 - Provides voltage or mA output that can be set for any range (0 to 10 VDC in 0.0016 V steps or 0 to 20 mA in 0.0031 mA steps)
- B) Auto/Manual Station (Local Control Unit - LCU)
- C) Polarity Detection

How to Order AE Series Electric Actuators

AE -	400 -	3	BF
PREFIX	TORQUE (LB - IN)	VOLTAGE	OPTIONS
AE	200	1 = 115 vac	0 = Standard
	400	2 = 24 vac	A = One extra switch & cam*
	600	3 = 220 vac	B = Two extra switches & cams*
	800		C = Three extra switches and cams*
	1000	4 = 12 vdc	D = Heater and Thermostat (15 watt)
	Enter all digits of Torque Value	5 = 24 vdc	F = Motor Brake (115 VAC & 24 VAC Only)
			H = Tropical Heater (15 watts)
			P = Positioner 4-20 mA
			T = Transmitter 4-20 mA

Note: AE will always be the first two characters of the part number, all digits from torque value must be entered into part number (i.e. 400, 1000, etc.) Only use one digit for voltage depiction (i.e. 1-5). For the options listing you may use more than one character, up to three, (i.e. O, AD or BD etc.)

Example:

AE-400-3BF:

400 lb. in.; 220 VAC; 2 extra switches and cams, motor brake

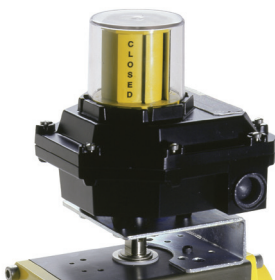
AE-1000-1D:

1000 lb. in.; 115 VAC; Heater and thermostat



ACTUATOR ACCESSORIES

VALVE POSITION MONITORS, SOLENOIDS AND POSITIONERS

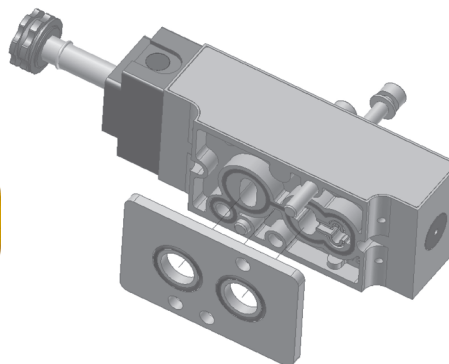


VALVE POSITION MONITORS

Here's the ultimate in valve monitoring: Position monitors feature a high visibility, color-coded indicator to display valve position. All monitors are designed to correspond to the latest NAMUR standard for actuator/position monitoring units. Plated steel or stainless steel mounting kits are available to provide a pre-engineered mounting solution for maximizing position monitor performance and direct mounting to actuators. Multiple brands available. See our Actuator Catalog for details.

SOLENOIDS

Apollo® actuators can be supplied with solenoids manufactured by AVC (Automatic Valve Company). Our 3/4 way, field convertible, direct mount (NAMUR pattern) solenoid valves feature a variety of interchangeable integrated molded coils. They're compatible with both spring return and double acting actuators.



POSITIONERS

Apollo valve positioners are excellent tools for increasing the gain of your valve package, often reducing your actuator size due to your increased ability to accurately control higher air deliveries, and the flexibility to add options and accessories to complete your control package's performance.

Their simple design makes PMV positioners (shown here) easy to understand, calibrate and repair. Rugged construction provides operation in a variety of tough applications. Compact size minimizes space requirements. A complete package means the user can select the right positioner for his application. A bright indicator makes it easy for operators to visually check the valve position. Spool valve design requires very little maintenance. The electro-pneumatic unit eliminates the need for an extra product and additional connections. PMV positioners are proven products recognized for providing years of reliable service. Other brands are also available from your Apollo distributor.

Apollo offers both pneumatic and electro-pneumatic positioners as standard. Pneumatic positioners may be used on either double acting or spring return actuators. The anodized aluminum housing provides excellent product integrity and good corrosion resistance. Options include special coatings, stainless steel housings and a variety of accessory items which can help you meet your most demanding control applications. See our Actuator Catalog for complete details.

