



Installation & Operation (I & O) Data

Pneumatic & Electric Actuated Bar Stock Ball Valves

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**Pneumatic
Spring-Return**



**Pneumatic
Double-Acting**



Electric

This information covers pneumatic and electric actuated threaded and tube compression end valve series 76 (threaded; one piece body reduced port), 86 (threaded; two piece body standard port), 96 (threaded; two piece body full port) and 82 (tube compression; two piece body standard port) models.

VALVE INFORMATION & SPECIFICATIONS:

AVAILABLE MATERIALS OF CONSTRUCTION

BODY: Brass - ASTM B-16, Carbon Steel - ASTM A108, 316 Stainless Steel ASTM A276, Alloy 20 - ASTM - B473, Monel - ASTM B164-75

BALL AND STEM: 316 Stainless Steel - ASTM A276 (standard except Alloy 20 & Monel)

SEATS AND STEM SEAL: Glass Reinforced P.T.F.E. (Teflon ®)

RATINGS

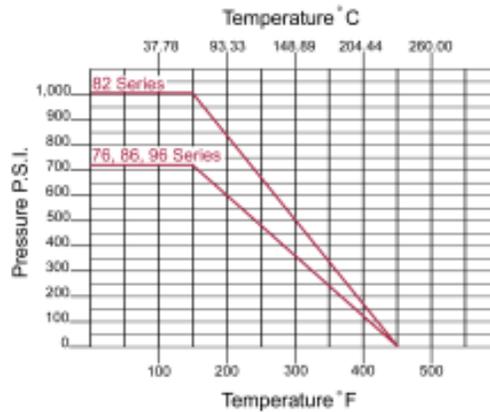
TEMPERATURE: -50°F to 450°F
(also see Pressure Temperature Chart)

PRESSURE:
Series 76, 86, 96 720 p.s.i. C.W.P.
Series 82 1,000 p.s.i. C.W.P.
(also see Pressure Temperature Chart)

VACUUM: 20 Micron

SATURATED STEAM: 150 p.s.i.

Pressure / Temperature Chart



FLOW CHARACTERISTICS

The approximate flow rate through a valve can be calculated as follows:

where; Q = flow rate in gallons (U.S. Std.) per minute

Cv = valve constant

P = pressure drop across the valve in pounds per square inch

G = specific gravity of the media of relative to water

Note: The values derived from the flow equation are for estimating purposes only. Product variances or systemic factors may alter actual performance.

$$Q = Cv \sqrt{\frac{\Delta P}{G}}$$

Size	Series			
	76	86	96	82
1/4	-	5.5	-	5.5
3/8	-	5.5	-	5.5
1/2	5.5	8	12	5.5
3/4	10	12	32	8
1	15.5	32	46	12
1-1/4	20	46	82	-
1-1/2	37	82	120	-
2	60	120	-	-

VALVE INFORMATION & SPECIFICATIONS: continued

INSTALLATION INSTRUCTIONS ; Threaded End Valves

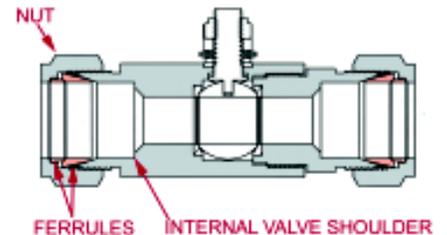
The following serves as a guideline for those experienced in pipe joint makeup. Otherwise, services of a certified pipe fitter should be utilized for installation.

1. Ensure that both the male pipe and female valve threads are free from dirt, debris and corrosion. Wire brushing of the male pipe threads is recommended to ensure a good metal-to-metal joint.
2. Apply a good quality thread lubricant (pipe dope) on the male threads. Lubricant reduces friction when pulling up the pipe joint. Note, thread lubricant is not intended to seal the joint and will not compensate for poor quality male pipe or fitting threads.
3. Turn the female valve threads onto the male pipe threads by hand. Upon free engagement of the threads, continue to turn the valve as far up as it will go (by hand). With the use of a wrench continue to tighten the valve onto the pipe. The pipe joint seal should occur within 1 to 3 turns after wrenching begins. Care should be taken not to exceed 3 turns in which damage to the threads can occur.
4. The pipe joint should be tested for leakage to ensure the pipe joint has been achieved.

INSTALLATION INSTRUCTIONS; Tube Compression Valves

Tube (initial assembly):

1. Ensure the tube end is square and free from burrs, nicks, scratches and debris.
2. Loosen the NUT by turning it counter-clockwise one turn. Insert the tube through the NUT and FERRULES until it sits against the internal VALVE SHOULDER. Tighten the NUT (clock-wise) hand tight. Continue tightening the NUT with a wrench for 1 to 1-1/4 turns or until snug.



Note: for re-assembly, after initial assembly, approximately 1/4 turn with wrench is generally required to re-tighten.

MAINTENANCE

Gemini Valves utilizes our self compensating stem seal design. This design automatically compensates for wear as well as thermal expansion and contraction resulting in a leak tight, maintenance free, service life.

Once the stem seal has worn beyond the compensation afforded by the Belleville springs adjustment of the stem nut may enable valve to be returned to service. Holding the 'flats' of the stem, tighten the stem nut until Belleville springs become fully compressed (flattened); the torque required to tighten the nut further increases sharply when this point is reached. Do not tighten the stem nut beyond this point to avoid damage of the stem seal.

Series 76 is not regarded as a maintainable product by Gemini Valve. Series 76 valves which have become worn out are ordinarily replaced. Series 86, 96 & 82 valves are of a two piece body design, which permits disassembly without any special tools. Although still promoted as maintenance free, replacement of the seats and stem seal may enable the valve to be returned to service. For stainless steel valves problems associated with 'galling' of the mating parts could result in body seal leakage and subsequent safety issues. For those customers who desire to attempt repair a VRK (Valve Repair Kit) kit is available from Gemini Valve.

PNEUMATIC ACTUATOR INFORMATION & SPECIFICATIONS:

MATERIALS OF CONSTRUCTION

BODY: Aluminium with Teflon® Impregnated Hard Anodized (PolyLube®) Surfaces

EXTERNAL HARDWARE: (Pinion Shaft, Driver, End Caps) 300 Series Stainless Steel

SPRING MODULES: Zytel® Housing, 300 Stainless Hardware

EXTERNAL TRIM: 300 Series Stainless Steel



RATINGS / SPECIFICATIONS

TEMPERATURE: -20°F to 350°F

POWER: 50 - 125 psi air. Sufficient air delivery must be available at the actuator to ensure dependable operation. The following precautions should be observed: Air supply should be clean and free of moisture. When dirty or wet air is a problem; a filter / separator should be specified; these units are most effective when installed as closely as possible to the actuator. A filter, when used, should permit a minimum flow of 4 scfm at an upstream pressure of 60 psi. Eliminate severe restrictions to air flow (certain solenoid valves & fittings). The most restricted passage must have an area no smaller than .012 inches square, the area of 1/8" diameter orifice. If more than a single actuator is to be supplied by an individual pilot, the minimum passage requirement applies per actuator.

TUBING: For short runs up to 5 feet 5/32" I.D. is suitable, 1/4" I.D. will serve up to 30 feet. For longer runs, use 3/8" I.D. or larger.

DUTY CYCLE: 100%

CYCLE TIME: (To Open or Close) Approximately 1/2 to 1 second*
* - Dependent upon actuator model, air pressure and delivery

MAINTENANCE

Gemini A500 Series Pneumatic Actuators are designed to be maintenance free and normally are replaced vs. repaired.

Double-Acting Models: For double-acting models, rebuilding of the actuator by our Factory Authorized Service Center may enable the actuator to be returned to service depending on the duty cycle the actuator has seen. The cost to rebuild the actuator is generally 50% of the cost of a new actuator. For details on this service please contact us. Additionally, for those customer desiring to replace O-rings, gasket(s) and lubricant, we offer O-ring kits which contain these genuine factory components.

Spring-Return Models: For the A500 Series spring-return models, rebuilding of the actuator by our Factory Authorized Service Center may enable the actuator to be returned to service depending on the duty cycle the actuator has seen. The cost to rebuild the actuator is generally 50% of the cost of a new actuator. For details on this service please contact us. O-rings kits are not available for the A500 Series Spring Return models.

GP PILOT VALVE INFORMATION & SPECIFICATIONS:

MATERIALS OF CONSTRUCTION

BODY: Aluminium with Teflon® Impregnated Hard Anodized (PolyLube®) Surfaces



SPOOL: 18-8 Stainless Steel

SEALS: Nitrile / Viton ®

HARDWARE: 18-8 Stainless Steel

COIL / BODY: GF Nylon / GF Zytel ®

RATINGS / SPECIFICATIONS

TEMPERATURE: Standard Model -20°F to 140°F, High Temperature Model -20 F to 350 F

TUBING: For short runs up to 5 feet 5/32" I.D. is suitable, 1/4" I.D. will serve up to 30 feet. For longer runs, use 3/8" I.D. or larger.

AIR SUPPLY CONNECTION: 1/8" NPT

ELECTRICAL CONNECTION: Mini-DIN by Wire Strain Relief (DS); Conduit (DC), Automotive (Field Bus M12) (DA)

POWER (Air & Electric):

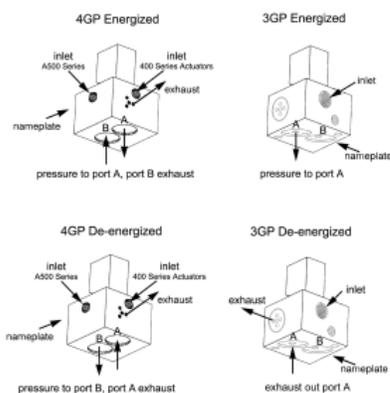
AIR: 50 - 125 psi air. Sufficient air delivery must be available at the actuator to ensure dependable operation. The following precautions should be observed: Air supply should be clean and free of moisture. When dirty or wet air is a problem; a filter / separator should be specified; these units are most effective when installed as closely as possible to the actuator. A filter, when used, should permit a minimum flow of 4 scfm at an upstream pressure of 60 psi. Eliminate severe restrictions to air flow (tubing & fittings). The most restricted passage must have an area no smaller than .012 inches square, the area of 1/8" diameter orifice.

ELECTRIC:

Standard 120VAC Coil; Wattage: 5, Class: F Continuous Duty, Protection: IP65 (with connector) Dust-tight, Water Resistant

FLOW CHARACTERISTICS

Flow Characteristics



MAINTENANCE

The GP Series requires no maintenance. Operating coils can be easily replaced if required.

ELECTRIC ACTUATOR INFORMATION & SPECIFICATIONS:

MATERIALS OF CONSTRUCTION

ENCLOSURE: Dupont® FR50 Cover, Teflon® Coated Cast Aluminum Base

SHAFT: 18-8 Stainless Steel

EXTERNAL TRIM: 300 Series Stainless Steel

RATINGS / SPECIFICATIONS

TEMPERATURE: 40°F to 150°F

MOTOR: Reversing, Brushless, Capacitor-Run with Auto-Reset Thermal Overload Protection.

GEAR TRAIN: Permanently Lubricated, Maintenance Free

POWER: 120VAC 50/60 Hz Single Phase

PORTS: (2) 1/2" N.P.T. Conduit

CYCLE TIME: 6 Seconds

DUTY CYCLE: Model 615 - 100%, Model 630 - 75%

TORQUE OUTPUT: Model 615 - 150 in-lbs, Model 630 - 300 in-lbs.

OVERRIDE: Manual - Fold Out Lever Handle

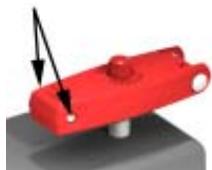
MAINTENANCE: No maintenance is required.

MANUAL OVERRIDE OPERATION

The push-button manual override system allows the user to easily disengage the electric drive gear train for manual operation of the actuator. All external power must be off prior to using the manual override feature. The actuator manual override handle can be used in the closed or open (lever extended) position to provide additional leverage. To open the handle, pinch the Lever Release Buttons and pull up. Press down the manual override button (atop the center) and turn the handle to manually open or close the actuated valve assembly. To reengage the drive train, release the override button and turn the handle until the manual override button 'clicks' signaling the re-engagement of the drive train. The manual override lever handle can then be closed.



Lever Release Buttons

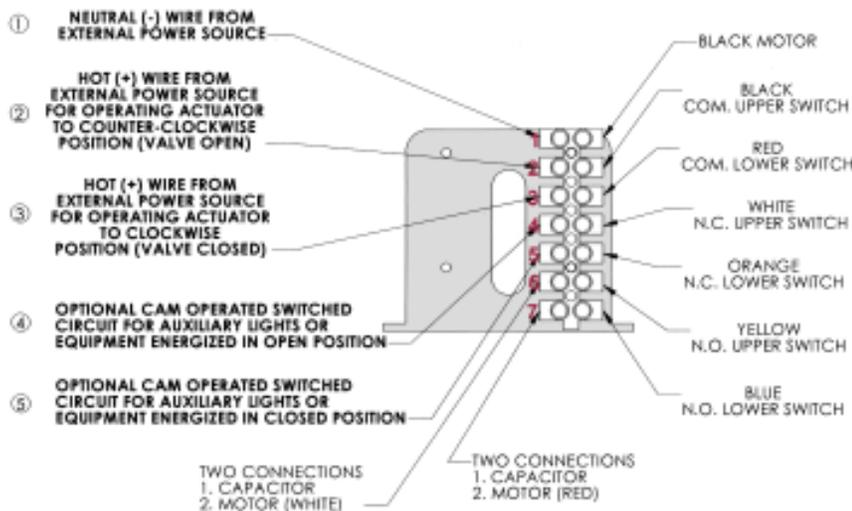
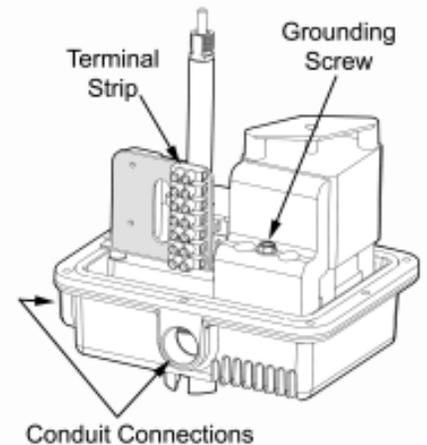


Manual Override Button



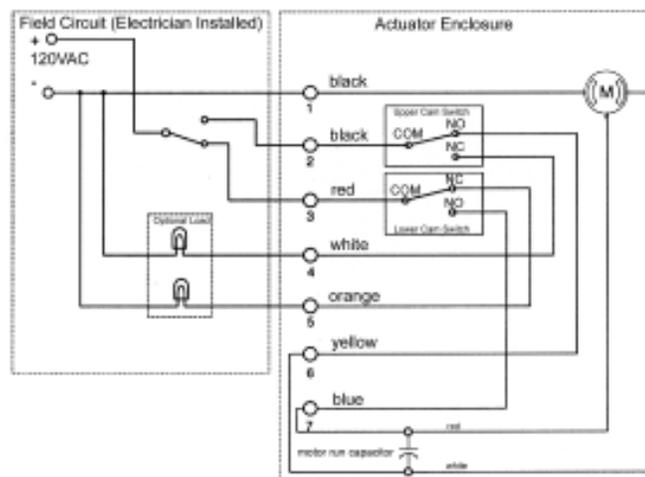
ELECTRIC ACTUATOR WIRING INSTRUCTIONS - AC MODELS

1. Unlatch and open the override handle to access the handle nut. Remove nut with 3/4" wrench.
2. Remove eight (8) socket head screws with 3mm hex wrench. Remove cover by pulling straight up.
3. Route the wire to be terminated through conduit hub and up through the access space to the terminal block. Strip insulation back 1/4", insert the stripped ends directly into the proper terminal clamps and tighten screws. All internal connections are labeled in the diagram below.
4. Attach grounding wire to green screw that is located on top of conduction bar.
5. Verify that cover o-ring is properly seated in groove. Replace cover and screws.



Connections 1 through 5 are to be made by field electrician

120AC Wiring Schematic



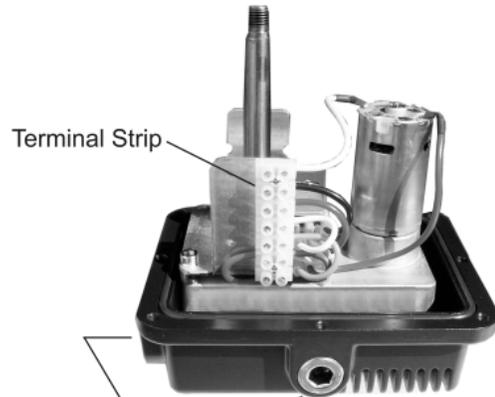
Note: Valve in Closed Position (handle perpendicular with piping)

ELECTRIC ACTUATOR WIRING INSTRUCTIONS - AC MODELS

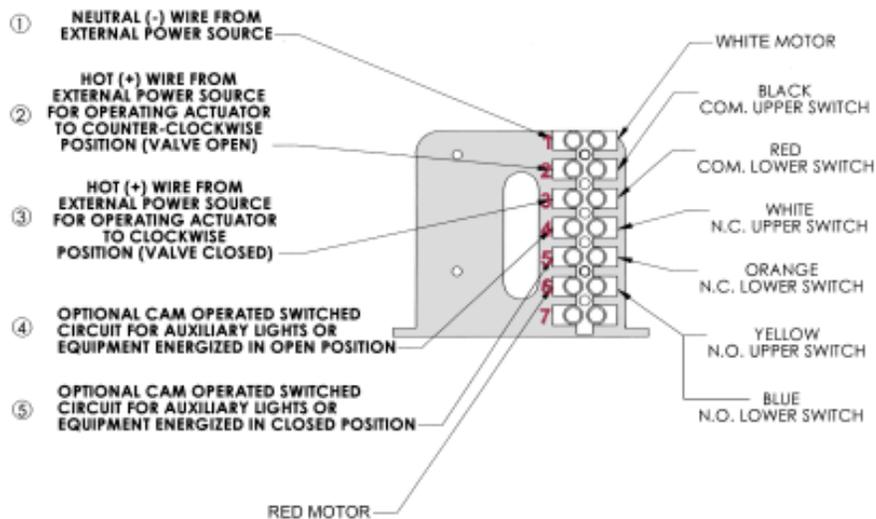
These instructions detail the procedure for wiring Gemini 600 Series DC model electric actuators.

1. Unlatch and open the override handle to access the handle nut. Remove nut with 3/4" wrench.
2. Remove eight (8) socket head screws with 3mm hex wrench. Remove cover by pulling straight up.
3. Route the wire to be terminated through conduit hub and up through the access space to the terminal block. Strip insulation back 1/4", insert the stripped ends directly into the proper terminal clamps and tighten screws. All internal connections are labeled in the diagram below.

4. Verify that cover o-ring is properly seated in groove. Replace cover and screws.



Conduit Connections



Connections ① through ⑤ are to be made by field electrician

DC Wiring Schematic

